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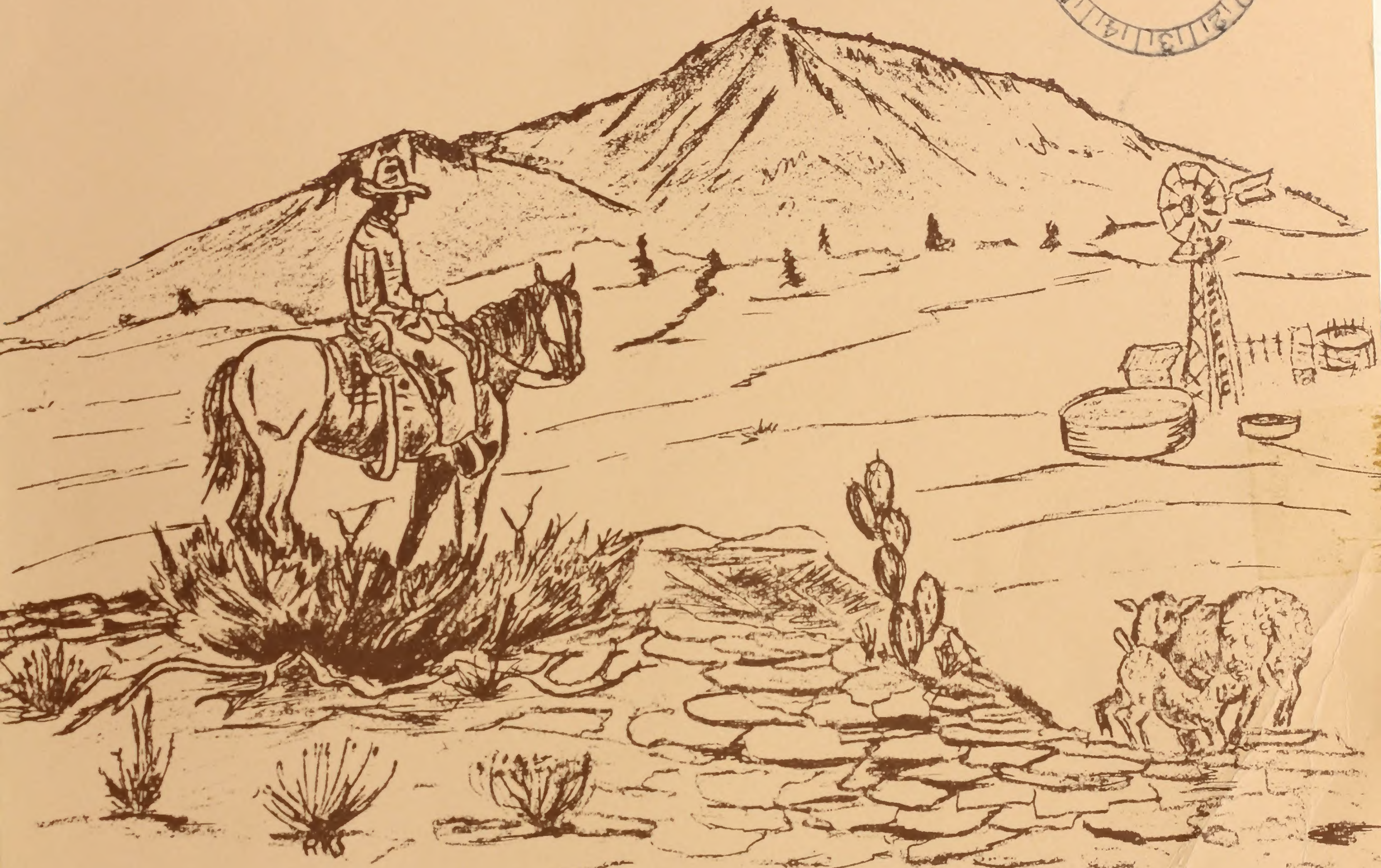

ROSWELL RESOURCE AREA

DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
ROSWELL DISTRICT OFFICE
FEBRUARY 1984

BLM-NM-PT-84-007-4322

IN REPLY REFER TO:
1601

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Roswell Resource Area
P. O. Drawer 1857
Roswell, New Mexico 88201

April 20, 1984

Dear Reader:

Enclosed for your review and comment is the Draft Management Framework Plan Amendment/Environmental Impact Statement (MFPA/EIS) for the Roswell Resource Area. This MFPA/EIS was prepared from data collected by the Bureau of Land Management and other sources, including information supplied by and in consultation with Federal, State, and local agencies, as well as universities and private individuals.

The Draft MFPA/EIS describes a Proposed Action, the District Preferred Alternative, and four additional alternatives for rangeland management. This document includes an analysis of the environmental, social, and economic effects of implementing any of the actions described.

Please retain this Draft MFPA/EIS for possible use in conjunction with the Final MFPA/EIS. If public review requires only minor changes to this Draft, then the Final EIS will be a supplement containing public comment, our response to those comments, and necessary changes and corrections. The public comment period will extend from April 20, 1984 to July 19, 1984. A public hearing will be held June 15, 1984 at the Roswell Inn, Rio Grande Room, 1815 North Main, Roswell, New Mexico, at 2:00 p.m. and 7:00 p.m.

We would appreciate receiving your comments regarding this Draft MFPA/EIS within the 90 day review period. Comments received after this period will be considered in the decision making process, although they may be too late for inclusion in the Final MFPA/EIS. The Final MFPA/EIS will be sent upon request or to those who have commented on the Draft.

Your comments should be sent to Phil Kirk, Area Manager, or Linda S. C. Rundell, EIS Team Leader, at the above address.

Sincerely yours,

Earl R Cunningham

District Manager

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DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

DRAFT

MANAGEMENT FRAMEWORK PLAN AMENDMENT
ENVIRONMENTAL IMPACT STATEMENT
ON
RANGELAND MANAGEMENT IN THE
ROSWELL RESOURCE AREA

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Abstract: The Bureau of Land Management, Roswell District Office, proposes to implement a rangeland management program for the Roswell Resource Area located in Chaves, Lincoln, Quay, Curry, DeBaca, Guadalupe, and Roosevelt counties of southeastern New Mexico. The Rangeland Management issue involves the amount of vegetation available for grazing and other uses; the methods of monitoring and evaluation, and rangeland improvements. Six alternatives, including a proposed action and the District's preferred alternative, have been analyzed: Proposed action, District Preferred Alternative, Industry Preferred Alternative, Elimination of Livestock Grazing, Maximization of Forage for Livestock, and Decreased Livestock Grazing. A discussion of the affected environment, and an analysis of the environmental consequences which would result from implementation of any one of the alternatives are included in this document.

Type of Action (x) Administrative ( ) Legislative

For Further Information Contact: Phil Kirk, Roswell Resource Area Manager

or

Linda S.C. Rundell, EIS Team Leader

at

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Comments have been requested from: See Chapter 4.

Date Draft Filed with EPA: APR 20 1984

Dates of Comment/Review Period: FROM APRIL 20, 1984 TO JULY 19, 1984

Recommended:

Earl R Cunningham
District Manager
Roswell District Office
Roswell, New Mexico

Approved:

Charles W Luscher
State Director, New Mexico

SUMMARY

INTRODUCTION

The Roswell District of the Bureau of Land Management is developing a rangeland management program for the Roswell Resource Area [(RRA) see Map 1-1]. The objectives of this program are, (1) to prescribe actions necessary to protect and improve the natural and environmental qualities of the area, (2) to provide food and habitat for wildlife and domestic animals, and (3) to provide for outdoor recreation and human occupancy and use.

The RRA contains approximately 1.5 million acres of public land in seven counties in southeastern New Mexico. Of this amount, approximately 500,000 acres are in Chaves County east of the Pecos River. A Grazing Environmental Impact Statement and rangeland management program were completed and approved for this area in September 1979. The program was implemented in late 1979 and early 1980. This document will not include any additional proposed actions for the east Chaves area except for the chemical control of shinnery oak (Quercus havardii).

In the area excluding east Chaves County, there are 284 grazing allotments permitted or leased to 221 livestock operators. The public lands on these allotments support approximately 13,000 cattle and 36,000 sheep.

Rangeland studies were established on this area in 1982. Initial range conditions determined from these studies place 25,000 acres (3 percent) in excellent condition, 510,000 acres (51 percent) in good condition, 340,000 acres (34 percent) in fair condition and 23,000 acres (2 percent) in poor ecological condition. The studies also included a determination of apparent trend. According to these studies, 845,000 acres are in an improving trend, 49,000 acres are in a static trend and 4,000 acres in a downward trend. Range condition and trend studies were not conducted on 93,000 acres of scattered isolated parcels of public land in the area.

Watershed studies place 60,000 acres (6 percent) in stable condition, 790,000 (79 percent) in a slight erosion class, 130,000 (13 percent) in a moderate class and 20,000 acres (2 percent) in a critical erosion class.

The area supports a variety of wildlife species, including approximately 25,000 mule deer and 4800 pronghorn antelope. Ninety-five percent of the public land habitat for these species is in fair to good condition and is in a static trend. Five percent of the area is in poor condition and also in a static trend. Mule deer and pronghorn antelope numbers are either static or experiencing an upward trend depending on the herd locations. Approximately 700,000 acres of public lands are involved in a special antelope habitat study. This study will determine the suitability of the 700,000 acres to support introduced populations of pronghorn antelope.

Upland game birds are found throughout the area with the exception of the lesser prairie chickens, which are only found east of the Pecos River.

In 1983, the 284 grazing allotments were placed in management categories based on 3 criteria: resource conflicts, range condition and trend, and potential for improvement. As a result of this study, 84 allotments (609,252 acres) were placed in an "M" or "Maintain" category, 38 allotments (290,493 acres) were placed in an "I" or "Improve" category and 162 allotments (93,666 acres) were placed in a "C" or Custodial" category. The purpose of categorization is to help establish priorities for distributing available funds and personnel in a manner which will achieve cost-effective improvement of rangeland condition and production. "I" category allotments have the highest priority for improvement.

DESCRIPTION OF ALTERNATIVES AND IMPACTS

Six rangeland management program alternatives have been developed for evaluation to determine which alternative or combination of alternatives will best achieve the 3 objectives mentioned earlier.

The alternatives, with a brief description, are discussed below.

PROPOSED ACTION (PA)

The Proposed Action is the continuation of current management practices (no action). It basically means things would be done and continue to happen, as they are at the present time. It includes the following components:

Authorized numbers of livestock would not change;

No new cooperative management plans (CMPs) would be developed;

BLM range improvement projects and vegetation treatments would be limited to the East Chaves area, Ft. Stanton Research Area, and allotments with existing Allotment Management Plans (AMPs).

The environmental consequences which would result with implementation of this alternative include the following:

Wildlife (big game, upland game and waterfowl) numbers would fluctuate slightly with climate and habitat conditions but would generally remain the same;

Range and watershed conditions would remain about the same and continue their current trends;

Recreation visitor hours would not change under this alternative;

No change in socioeconomic conditions would occur.

DISTRICT PREFERRED ALTERNATIVE (DPA)

The management direction in this program is to enhance multiple resource values and correct identified problems through specific management actions. The DPA includes the following components:

Livestock numbers would decrease 4 percent in the short term and increase 7 percent in the long term;

CMPs would be prepared on the 38 allotments in the "I" category;

BLM range improvements and vegetation treatments would be implemented on the "I" category allotments.

The environmental consequences which would result with implementation of this alternative include the following:

Wildlife numbers would increase or remain unchanged.
Mule deer +17%
Antelope +27%
Upland game and waterfowl - unchanged

Range conditions would improve; acreage in the good condition class would increase by 34 percent;

Watershed conditions would improve with the acreage in the critical erosion class decreasing by 35 percent;

Recreation visitor hours would increase by 18 percent (10,151 hours);

Socioeconomic conditions would reflect a 3.9 percent increase in ranch operators' overall gross income.

INDUSTRY PREFERRED ALTERNATIVE (IPA)

This alternative was developed and offered by the New Mexico Department of Agriculture and the Southeastern New Mexico Grazing Association. In this alternative, emphasis is placed on range improvements and vegetation treatments with minimal BLM management. It includes the following:

Livestock numbers would decrease 4 percent in the short term and increase 3 percent in the long term;

No new CMPs would be developed;

BLM range improvements and vegetation treatments would be implemented on the "I" category allotments through development plans.

The environmental consequences which would result with implementation of this alternative include the following:

Wildlife numbers would increase or remain unchanged;
Mule deer +11%
Antelope +9%
Upland game and waterfowl - unchanged;

Range conditions would improve, with acreage in the good condition class increasing by 8 percent;

Watershed conditions would improve, with the acreage in the critical erosion class decreasing by 20 percent;

Recreation visitor hours would increase by 13 percent (7,403 hours);

Socioeconomic conditions would reflect a 3.5 percent increase in ranch operators' overall gross income.

ELIMINATION OF LIVESTOCK GRAZING (ELG)

All domestic livestock grazing would be removed from the public lands under this alternative, which includes the following components:

Livestock numbers would decrease 78 percent in the short term and 100 percent in the long term;

Existing AMPs would be cancelled. No new CMPs would be developed;

BLM rangeland improvement projects would be for wildlife habitat and watershed improvement by special appropriation.

The environmental consequences which would result with implementation of this alternative include the following:

Wildlife numbers would increase:
Mule deer +33%
Antelope +49%
Upland game and waterfowl - slight increase;

Range conditions would improve, with acreage in the good conditon class increasing by 53 percent;

Watershed conditions would improve, with the acreage in the critical erosion class decreasing by 20 percent;

Recreation visitor hours would increase by 35 percent (19,040 hours);

Socioeconomic conditions would reflect a 47.8 percent decrease in ranch operators' overall gross income.

MAXIMIZATION OF FORAGE FOR LIVESTOCK (MAX)

The management direction under this alternative is to initiate an intensive program of rangeland management to achieve maximum forage production for livestock. It includes the following:

Livestock numbers would decrease 5 percent in the short term and increase 28 percent in the long term;

CMPs would be prepared on 122 allotments in the "M" and "I" categories;

BLM range improvements and vegetation treatments would be implemented on "M" and "I" category allotments.

The environmental consequences which would result with implementation of this alternative include the following:

Wildlife numbers would decrease:
Mule deer -5%
Antelope -25%
Upland game and waterfowl - slight decrease;

Range conditions would change, with a 20 percent decrease in the good condition class acreage;

Watershed conditions would improve, with the acreage in the critical erosion class decreasing by 35 percent; [a]

Recreation visitor hours would decrease by 7 percent (3,633 hours);

Socioeconomic conditions would reflect a 17.7 percent increase in ranch operators' overall gross income.

DECREASED LIVESTOCK GRAZING (DLG)

Management direction is to improve range and watershed conditions and wildlife habitat through livestock reductions. Included in this alternative are the following:

Livestock numbers would decrease 8 percent in the short term and 23 percent in the long term;

No new CMPs would be developed;

BLM range improvement projects would be limited to the East Chaves area, Ft. Stanton, and allotments with existing AMPs.

The environmental consequences which would result with implementation of this alternative include the following:

Wildlife numbers would increase or remain unchanged:
Mule deer +21%
Antelope +16%
Upland game and waterfowl - unchanged;

Range conditions would improve, with the acreage in the good condition class increasing by 52 percent;

Watershed conditions would improve, with the acreage in the critical erosion class decreasing by 20 percent;

Recreation visitor hours would increase by 17 percent (9,462 hours);

Socioeconomic conditions would reflect a 19.5 percent decrease in ranch operators' overall gross income.

[a] Vegetation treatments would be accomplished on the areas that are included in the critical erosion class and management would be applied to these areas.

COMPARISON OF ENVIRONMENTAL CONSEQUENCES

	PA		DPA		IPA		ELG		MAX		DLG	
	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term
Vegetation												
AUMs	228,656	228,656	219,695	246,028	219,695	236,937	51,924	0	220,871	296,061	175,686	175,686
Forage Production	NC	NC	NC	7%	NC	4%	4%	2%	8%	-1%	NC	2%
Ecological Condition Class (ac) a/												
Undetermined ("C") b/	NC	93,666	NC	93,666	NC	93,666	NC	93,666	NC	93,666	NC	93,666
Excellent	NC	25,332	NC	25,332	NC	25,332	NC	25,332	Dec	20,262	NC	25,332
Good	NC	510,108	Inc	683,427	Inc	552,150	Inc	780,201	Dec	408,086	Inc	774,939
High Fair	NC	270,093	Dec	151,584	Dec	248,715	Dec	45,210	Inc	447,895	Dec	47,922
Low Fair	NC	70,710	Dec	39,402	Dec	65,558	Dec	25,500	Dec	18,798	Dec	28,050
Poor	NC	23,502	Dec	0	Dec	7,990	NC	23,502	Dec	4,704	NC	23,502
Soils/Watershed												
Surface Runoff												
Range Site:												
Loamy/Gyp Upland	NC	NC	NC	NC	NC	NC	NC	NC	Inc	10%	NC	NC
Loamy	NC	NC	Dec	-18%	Dec	-9%	Dec	-9%	Dec	-9%	Dec	-9%
Loamy/Hills	NC	NC	NC	NC	NC	NC	Dec	-37%	Inc	20%	Dec	-19%
Sandy	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Malpais	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Limestone Hills	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Sediment Yield	NC	.40 ac ft/ sq mi/yr	Dec	.30 ac ft/ sq mi/yr	Dec	.35 ac ft/ sq mi/yr	Dec	.35 ac ft/ sq mi/yr	Dec	.30 ac ft/ sq mi/yr	Dec	.35 ac ft/ sq mi/yr
Erosion Classes (ac)												
Stable	NC	59,605	Inc	61,605	Inc	60,605	Inc	60,605	Inc	61,605	Inc	60,605
Slight	NC	784,795	Inc	787,795	Inc	786,795	Inc	786,795	Inc	787,795	Inc	786,795
Moderate	NC	129,143	Inc	131,143	Inc	130,143	Inc	130,143	Inc	131,143	Inc	130,143
Critical	NC	19,868	Dec	12,868	Dec	15,868	Dec	15,868	Dec	12,868	Dec	15,868
Daily Livestock Consumption (Gals)	NC	228;700	219,700	246,000	219,700	236,900	51,900	0	220,900	296,100	211,000	175,700
Wildlife												
Special Habitat Features (SHFs)	NC	NC	NC	NC	NC	-	+	+	-	-	NC	NC
Desert Mule Deer												
West c/	NC	1,809	Inc	2,100	Inc	2,050	Inc	2,435	Dec	1,700	Inc	2,179
(east) d/	NC	300	Inc	518	NC	NC	NC	NC	NC	NC	NC	NC
Pronghorn Antelope												
West c/	NC	385	Inc	469	Inc	415	Inc	512	Dec	240	Inc	436
(east) d/	NC	219	Inc	365	NC	NC	NC	NC	NC	NC	NC	NC
Prairie Chickens d/	NC	2,600	Inc	3,700	NC	NC	NC	NC	NC	NC	NC	NC
Mourning Dove	NC	NC	Inc	Inc	Inc	Inc	Inc	Inc	Dec	Dec	NC	NC
Scaled Quail	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Threatened and Endangered Plants and Animals	Any action which could adversely impact a T&E species requires site-specific mitigation to avoid a "may-affect" determination.											
Air Quality	NC	NC	Dec	Inc	Dec	Inc	Inc	Inc	Dec	Inc	Inc	Inc
Cultural Resources	NC	NC	NC	NC	NC	NC	-	+	-	-	+	+
Recreation												
Cave Resources	NC	NC	+	+	NC	+	+	+	-	-	+	+
Visitor Hours:												
West c/	55,156	55,156	Inc	65,307	Inc	62,559	Inc	74,196	Dec	51,523	Inc	64,618
(east) d/	NC	11,006	Inc	17,335	NC	NC	NC	NC	NC	NC	NC	NC
Visual Resources	NC	NC	Dec	Inc	Dec	Inc	Inc	Inc	Dec	NC	NC	Inc
Socioeconomic Conditions												
Gross Income	$6,031,975	$6,031,975	$5,921,318	$6,269,240	$5,921,318	$6,244,321	$3,730,719	$3,148,691	$5,929,598	$7,104,324	$4,855,740	$4,855,740
Employment (no. of jobs)	NC	NC	-7	14	-7	12	-195	-230	-6	63	-70	-70
Personal Income	NC	NC	-$45,700	$98,000	-$45,700	$84,200	-$950,000	-$1,193,000	-$42,000	$442,708	-$486,575	-$486,575
Recreation Revenue e/												
West c/	NC	$759,273	Inc	$832,256	Inc		Inc	$895,874	Dec	$732,039	Inc	$827,090
(east) d/	NC	$73,207	Inc	$116,001	NC	NC	NC	NC	NC	NC	NC	NC

Source: BLM RRA EIS Files

a/ Short term change is in the number of acres per class
b/ Condition class as yet undetermined due to the small amounts of public land involved or isolated and scattered tracts
c/ Resource Area excluding Chaves County east of the Pecos River
d/ Chaves County east of the Pecos River
e/ Dollars/year generated by recreational activities on public land

NC: No change
+: Beneficial
-: Adverse
Inc: Increasing or Improving
Dec: Decreasing or Declining

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CHAPTER 1

PROPOSED ACTION AND ALTERNATIVES

HOW TO READ CHAPTER 1

Chapter 1 is the WHO, WHAT, WHY, WHEN, and WHERE chapter. It sets the "scene" for the remainder of the document by describing the purpose of developing an Environmental Impact Statement, the planning process which was used, and the alternatives which have been proposed. Descriptions of the following items begin on the pages shown:

page no.

PURPOSE AND NEED 1-1

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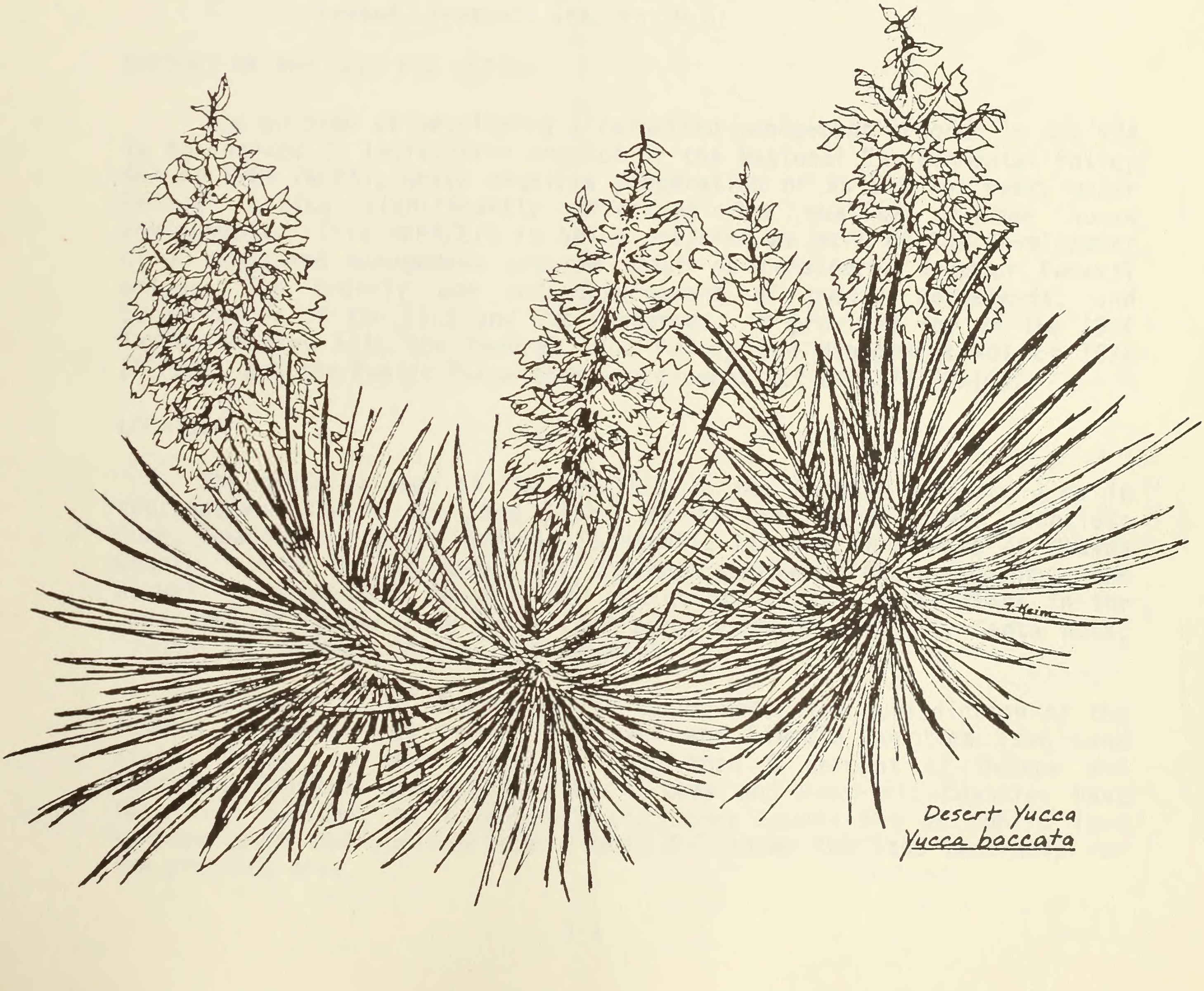


Desert Yucca
Yucca boccata

CHAPTER 1

PROPOSED ACTION AND ALTERNATIVES

INTRODUCTION

The Roswell District of the Bureau of Land Management (BLM) proposes to implement a rangeland management program in the Roswell Resource Area (RRA), which would maintain or improve rangeland conditions on approximately 1.5 million acres of public land. The programs analyzed in this document, the Roswell Management Framework Plan Amendment/Environmental Impact Statement (MFPA/EIS), include six alternative plans of action which are described beginning on page 1-9. The six alternatives are:

A. Proposed Action (PA)
B. District Preferred Alternative (DPA)
C. Industry Preferred Alternative (IPA)
D. Elimination of Livestock Grazing (ELG)
E. Maximization of Forage for Livestock (MAX)
F. Decreased Livestock Grazing (DLG)

PURPOSE OF AND NEED FOR ACTION

The purpose of developing a rangeland management program in the RRA is to respond to legislation enacted by the National Environmental Policy Act of 1969 (NEPA), which requires preparation of an EIS for every major Federal action significantly affecting the quality of the human environment. This MFPA/EIS is being prepared as part of the development of a rangeland management program which is considered a major Federal action. The orderly use and development of public rangelands, and conservation of the land and its resources, is provided for in the 1934 Taylor Grazing Act, the Federal Land Policy and Management Act of 1976 (FLPMA), and the Public Rangelands Improvement Act of 1978 (PRIA).

LOCATION

The planning area of the MFPA/EIS is the Roswell Resource Area in southeastern New Mexico (Map 1-1). It is made up of seven counties: Quay, Guadalupe, Curry, DeBaca, Roosevelt, Lincoln, and most of Chaves County. With the exception of extreme southwest Chaves County, the Roswell Resource Area boundary follows county lines. Major towns in the area include Roswell, Ruidoso, Carrizozo, Portales, Clovis, Santa Rosa, Vaughn, Ft. Sumner, Corona, and Tucumcari.

The majority of blocked public lands under the jurisdiction of the Roswell Resource Area occur in Chaves and Lincoln Counties (see Land Status Visual in back pocket). Less than 3 percent of DeBaca and Guadalupe Counties are public lands. Quay and Roosevelt Counties have less than one-half of a percent, and Curry County has no public land surface under BLM jurisdiction. Table 1-1 shows the land ownership for the planning area.

TABLE 1-1
LAND OWNERSHIP

Land Owner	Acres	Percent of Area
BLM-Administered Surface	1,486,942 a/	10.6
Private	9,900,096	70.6
State	1,819,586	13.0
Other Federal	808,096	5.8
Total	14,014,720	99.8

Source: BLM RRA Office files

a/ Of this figure, 425,263 acres are in Chaves County, east of the Pecos River. This area was previously analyzed in the East Roswell Grazing EIS (1979). Decisions from that plan are currently being implemented and will be addressed in this document only where changes are proposed. The categorization of East Side allotments occurred subsequent to the filing of the East Roswell EIS. These categorizations are displayed in Appendix B-4.

THE PLANNING PROCESS

The BLM planning process is generally comprised of nine steps (detailed in Instruction Memorandum 83-339, and 43 CFR 1601-5):

1. Issue identification - items of concern
2. Development of planning criteria
3. Inventory process
4. Analysis of management situation
5. Formulation of alternatives
6. Estimation of effects
7. Selection of preferred alternative
8. Selection of a plan
9. Evaluation of plan

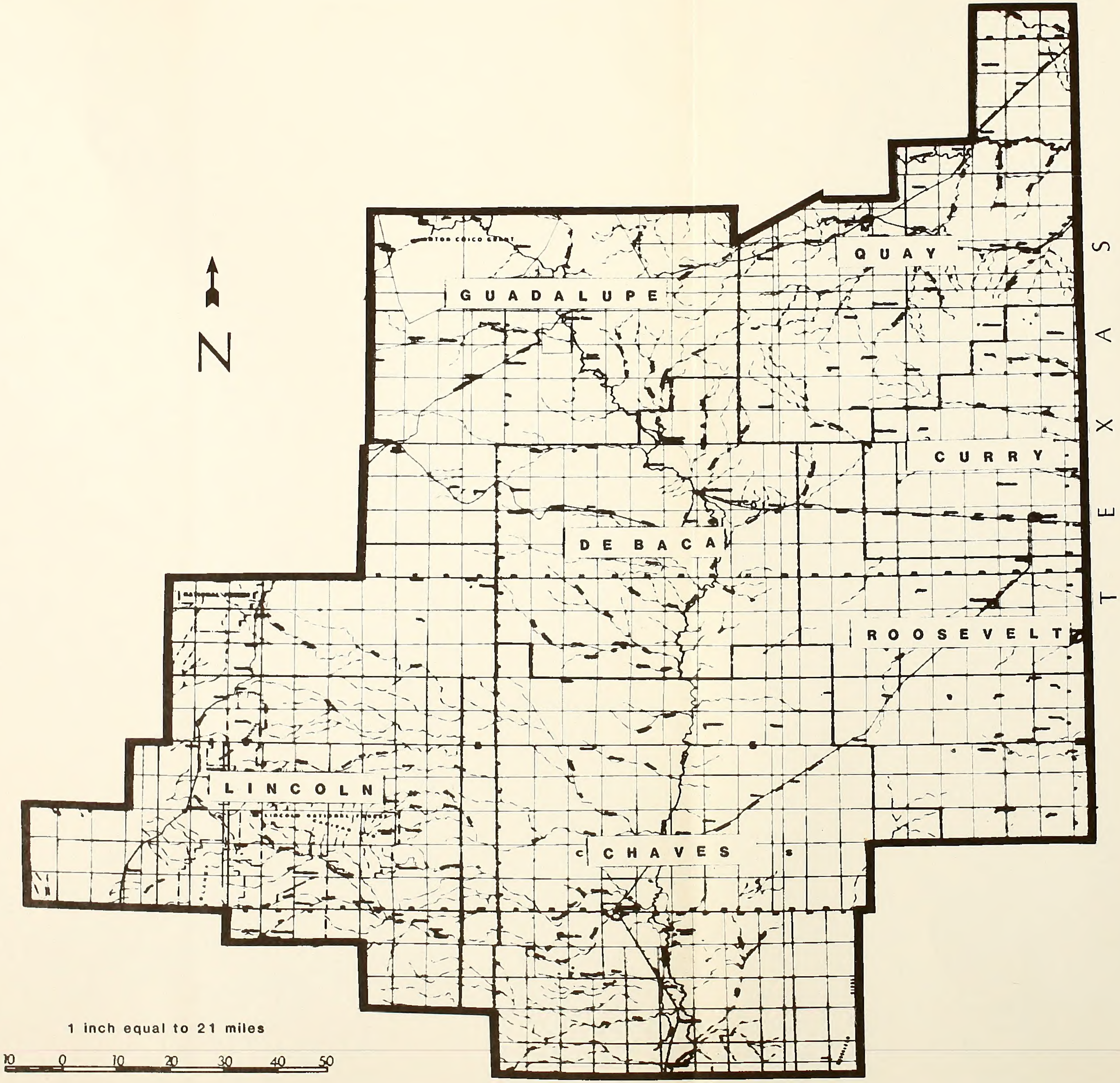
These nine steps, as discussed below, focus on the issue(s) or items of concern and provide for the development and selection of a management program.

Issue Identification - Items of Concern

Items of concern were identified through public inquiry meetings (see Chapter IV for more detail), a BLM Interdisciplinary Team, and management. It was jointly determined that these concerns could be adequately addressed under a Rangeland Management issue. Planning criteria were developed according to the Grazing Management Policy of March 1982 with input from the public, the Grazing Advisory Board, and the BLM Interdisciplinary Team. The following items of concern were identified:

Livestock - Vegetation

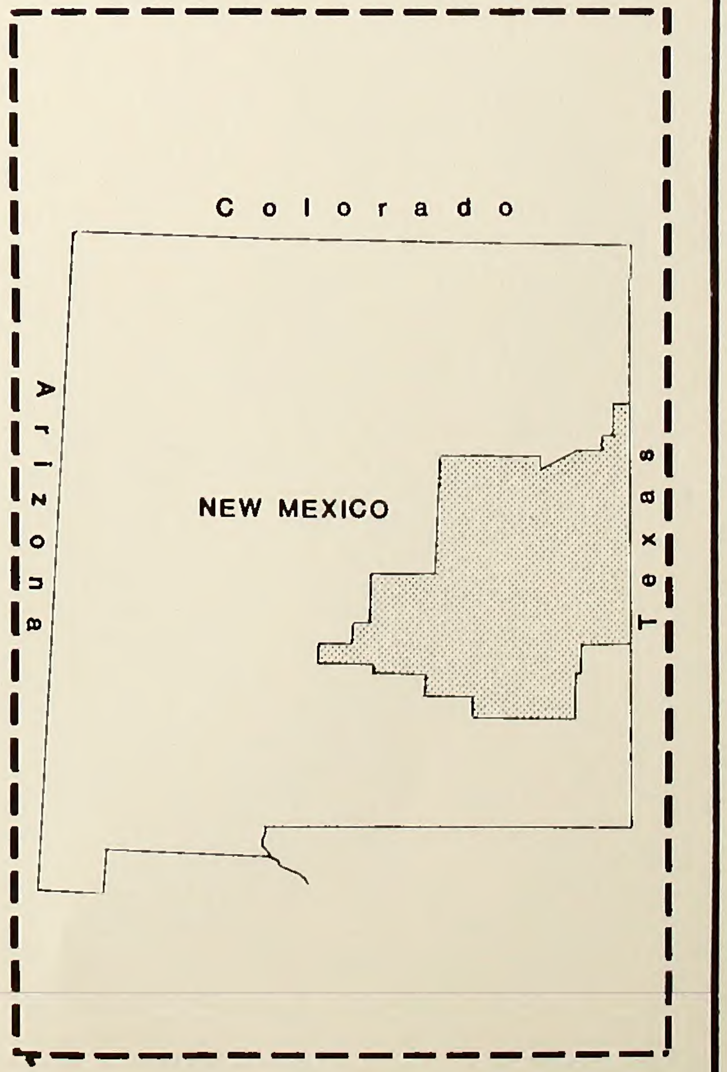
The need for Cooperative Management Plans (CMPs), grazing programs, and range improvement facilities to achieve better distribution of livestock and wildlife and improve range conditions;



U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Roswell District Office
Roswell Resource Area
1984

ROSWELL
MANAGEMENT FRAMEWORK PLAN
AMENDMENT
ENVIRONMENTAL IMPACT STATEMENT

MAP 1-1
ROSWELL RESOURCE AREA



A need for disbursement of range improvement funds based on resource needs and the potential for improvement;

The need to allocate forage based on results of inventory and extended monitoring programs;

The need for vegetation treatments, including the use of herbicides or mechanical means to control undesirable brush, and the use of fire (prescribed burning) for maintenance;

Wildlife/Livestock Interrelationships

A concern on the availability of forage for wildlife;

The need to develop Habitat Management Plans (HMPs);

A concern on the enhancement of riparian areas;

Watershed Stabilization

The need to enhance watersheds through improved range condition including developing range and watershed improvement projects, and designing grazing management systems which would prevent and decrease erosion and increase water quality and quantity.

Development of Planning Criteria

The BLM Grazing Management Policy issued on March 5, 1982 (Washington Office Instruction Memo No. 82-292) establishes guidelines for categorization of rangelands. The objective is to distribute available funds and personnel in the most effective and efficient manner to improve range condition and production. Allotments were categorized using the criteria displayed in Figure 1. Allotments could be shifted into a different category if ecological conditions change or conflicts are created or resolved. (Appendix A-1 explains the methodology used for inventory and categorization. Appendices B-1 through B-4 list the grouping of allotments into categories. See Appendix A-2 for a discussion of the Consultation Policy adopted in New Mexico, pursuant to Section 8 of the Public Rangeland Improvement Act.)

Inventory Process

Range site and vegetation type-mapping was initiated in the summer of 1981. The field inventory (see Appendix A) was conducted in a four-part process starting in early fall 1981 through the spring of 1983 and included the following determinations:

1. Ecological condition (weight estimate)
2. Trend (point-pace transect)

ROSWELL RESOURCE AREA

RANGE CATEGORIZATION CRITERIA

CATEGORY M (MAINTAIN)	CATEGORY I (IMPROVE)	CATEGORY C (CUSTODIAL)
An allotment must meet conditions 1, 2, & 3 or 1, 2, & 4 (below):	An allotment must meet any one of the following 3 conditions:	An allotment must meet all of the following conditions:
1. Has no significant resource conflicts.	1. Has a potential significant resource conflict.	1. Has no significant resource conflict.
AND	OR	AND
2. Has only a moderate potential for improvement in forage production.	2. Has a high potential for improvement in forage production and a range condition rating of 50 or less.	2. Has a low potential for improvement in forage production.
AND	OR	
3. Has a range condition rating of 38 to 51 and an improving range trend.	3. Has a range condition rating of 50 or less and a static or declining range trend.	OTHER CONSIDERATIONS Contains less than 30% public land or less than 1,540 acres public land.
OR		
4. Has a range condition of 51 or higher and a static or improving range trend.	OTHER CONSIDERATIONS Contains 30% or more public land or more than 1,540 acres public land.	
OTHER CONSIDERATIONS Contains 30% or more public land or more than 1,540 acres public land.		

NOTE: Any parcel of public land, regardless of size, with an identified significant resource conflict, will qualify for the "I" category.

Figure 1

3. Production (weight estimate)
4. Utilization (point-pace transect).

Information on actual use and precipitation is being collected annually to supplement the other data (see Table 1-6).

Rangeland monitoring studies will provide the basis for evaluating the effects of implemented management actions and also making future rangeland management decisions. More detailed information on methodology and monitoring is presented in Appendix A-1.

Analysis of Management Situation

A current analysis of the management situation (AMS) for the planning area was prepared by a BLM Interdisciplinary Team in February 1983. This analysis compiled all existing and newly developed data into a document which includes the following components:

1. A brief description of the existing environment
2. Problems resulting from current management practices
3. Opportunities to resolve problems or make improvements.

A copy of the AMS document is available for viewing at the Roswell Resource Area Office.

Formulation of Alternatives

The information compiled in the AMS was used in the formulation of several alternatives designed to resolve the identified problems and achieve improvement where possible. Three alternatives were initially identified for detailed analysis; three additional alternatives were added later in response to public input and internal directives.

Estimation of Effects

The analysis of anticipated impacts, as a result of implementing any one of the six alternatives, is presented in Chapter 3. A comparative chart (Table 1-7) summarizing the effects is found at the end of this chapter.

Selection of Preferred Alternative

A preferred alternative was selected following an evaluation of all alternative action plans and anticipated impacts. The preferred alternative provides the means to protect or enhance and properly utilize the public land resources within the RRA, it conforms with the BLM Grazing Management Policy, and it responds to social and economic concerns. The preferred alternative described in this Draft MFPA/EIS is labeled as the District Preferred Alternative (DPA). It is labeled as a preferred alternative for analysis purposes only. The plan ultimately selected may be different depending on analysis results.

Selection of a Plan

Following publication of the Draft EIS, the Roswell District Manager will evaluate all comments received and develop a proposed resource management plan. The plan will be described in the Final EIS. The plan selected will respond to the needs of the public lands and the public land users in the RRA. It may include all aspects of one alternative or may incorporate aspects of several alternatives. Included in the evalaution criteria which will be used in plan selection are:

Does the plan provide a cost effective approach to land and resource management?
Does it provide multiple use guidelines for all resources throughout the plan area?
What are the social and economic impacts?
What are the impacts on surface values (wildlife habitat, watershed quality, range vegetation, recreation, cultural resources)?
What are the impacts on existing land uses?
Is it compatible with adjoining land uses and other Federal and State agency policies?
Does it provide the flexibility to respond to internal (Bureau initiated) or external change?
Does it provide multiple use opportunities for public land users?

After all comments have been considered and any necessary changes in the proposed plan made, the State Director approves the plan for implementation by issuing a concise, public Record of Decision (ROD). The ROD is a brief statement indicating (a) which alternative or combination of alternatives is approved as the plan, (b) what alternatives were considered in reaching this decision, and (c) whether all practicable means to avoid or minimize environmental harm from the plan have been adopted, and if not, why not.

Evaluation of Plan

Following the publication of the Final EIS and ROD, intervals and standards for monitoring and evaluating the plan will be established. The intervals will not be more than 5 years. Standards will be developed to determine whether mitigating measures are satisfactory, whether assumptions used in the assessment of impacts were correct, or whether there has been significant change in the related plans of other Federal agencies, State or local governments, or Indian tribes. The information gained will be used to correct problems and will be incorporated into any future planning.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

For the purpose of analysis, two levels of livestock grazing use will be considered: 5-year-average licensed use and total adjudicated preference. Licensed-use estimates, obtained from grazing records, comprise about 92 percent of preference. Licensed use does not necessarily reflect actual numbers grazed or changes in range condition, but may be based on a number of variables, such as market and weather conditions. Preference is the full amount of AUMs (Animal Unit Months) of livestock use that could be activated and used on public land in the area. Preference in the RRA was originally adjudicated between 1937-1943 following passage of the 1934 Taylor Grazing Act. Estimated-5-year-average licensed use is 228,656 AUMs; total preference is 249,535 AUMs.

Grazing Permits are issued to qualified applicants within grazing districts pursuant to Section 3 of the Taylor Grazing Act; grazing leases are issued on public lands outside of grazing districts in accordance with Section 15 of the Taylor Grazing Act. Permits and leases are issued for a term not to exceed 10 years. Nonrenewable grazing authorizations may be granted to qualified applicants when forage is temporarily available, provided the use is consistent with multiple use objectives. Suspended preference is the portion of a grazing preference for which active grazing use will not be reauthorized until forage is available and allocated for livestock grazing use on a sustained yield basis.

PROPOSED ACTION (PA)

The PA emphasizes a continuation of present management direction based on the permittee's 5-year-average licensed use. It will be used to provide a baseline for the comparison of other alternatives. As no actions other than approval of grazing at current levels are proposed, the action is a "No Action" alternative. The PA is not the preferred alternative. Guidelines which make up the existing management direction include the following:

Initial and long-term stocking rates for livestock would be set at the 5-year-average licensed use level of 228,656 AUMs (see Appendix B-5).

BLM range improvement funds received annually would be available for use only in areas where existing plans have been approved (Ft. Stanton MFP, East Chaves MFP).

Existing active AMPs would be maintained, including construction of new range improvements where needed. No new grazing management plans would be developed.

Management of big game habitat would continue under the current management direction with the goal of supporting existing herd numbers.

DISTRICT PREFERRED ALTERNATIVE (DPA)

Under the DPA, the management direction is to enhance multiple resource values through a rangeland improvement program in accordance with current BLM policy. The DPA is designed to correct identified problems using a more intensive management program than is currently prescribed (as in the PA). Management guidelines include the following:

> Short-term stocking rates, based on range condition and trend ratings, are anticipated to be 219,695 AUMs, with adjustments as needed being taken as needed in the "I" category allotments. Long term stocking rates are projected to be 246,028 AUMs (Appendix B-5), with increases coming in "M" and "I" category allotments. Adjustments would be based on monitoring studies. Initial and long-term stocking rates would be determined, using available resource data, and with consultation with permittees and the Target Group (see Appendix A-2).
>
> Funding for BLM range improvements and vegetation treatments would be ranked by priority (benefit/cost), with "I" category allotments receiving highest priority. Range improvements on "I" category allotments would be: 15.5 miles of 4-strand barbed wire fence, 17.5 miles of net wire fence, 38 new water developments, and 32.5 miles of water pipeline. Net-wire fence would not be constructed in antelope use areas.
>
> Vegetation treatments with BLM funds would occur on 47,022 acres west of the Pecos River as shown in Table 1-2 (see Appendix C-1 for treatments by allotment).
>
> Shinnery oak control (with the herbicide tebuthiuron) would be implemented over a 15 year period on approximately 150,000 acres east of the Pecos River. This area was previously analyzed in the 1979 East Roswell Grazing EIS (refer to this document for detailed allotment analysis). Recent research has indicated a need to reevaluate the impacts, both beneficial and adverse, of shinnery oak control. For this reason, it has been included for analysis in the DPA, although it could be included in the Final Plan under any alternative. Nine allotments have been identified for shinnery oak control (Appendix C-3).
>
> Documented grazing programs and/or development plans (CMPs) would be implemented on "I" category allotments (290,493 acres of public land). Specific programs and plans would be applied to individual allotments on a priority basis beginning with those allotments with the highest potential for improvement. Grazing programs would include deferred, rotation, high-intensity-short duration systems and other specific grazing systems which combine proper grazing use with scheduled rest periods.
>
> Additional forage would be provided to big game from vegetation treatments and improved range condition. The long-term goal (for the area west of the Pecos River) is to improve habitat for big game. The long term goal (east of the Pecos River) is to increase the amount of sand bluestem grass and decrease shinnery oak to improve prairie chicken habitat.

TABLE 1-2
DPA PROPOSED VEGETATION TREATMENTS

Allotment Category	Target Vegetation and Type of Control	Acres
I	Mesquite	
	-Mechanical	1,785
	-Chemical	20,065
I	Cholla	
	-Mechanical	14,410
I	Creosote	
	-Chemical	1,970
I	Snakeweek	
	-Chemical	8,142
I	Sacaton	
	-Prescribed Burn	650
	Total	47,022
(East Chaves Co.)	Shinnery	
	-Chemical	153,820

Source: RRA Inventory Files

INDUSTRY PREFERRED ALTERNATIVE (IPA)

This alternative was developed and offered by the New Mexico Department of Agriculture and the Southeastern New Mexico Grazing Association. In this alternative, emphasis is placed on range improvements and vegetation treatments with minimal BLM management. The major components of this alternative are:

Any proposed changes in numbers of livestock would be determined following consultation with permittees, the Target Group (see Appendix A-2), and by using available resource data.

BLM analysis of this alternative indicates that in the short-term, stocking rates would be 219,695 AUMs, with downward adjustments based on range condition and trend, being taken in the "I" category allotments. Adjustments would be based on BLM monitoring studies. Long-term stocking rates are estimated to be 236,937 AUMs (see Appendix B-5).

The processing of privately funded range improvements would have priority over BLM initiated and funded projects. Construction, installation, modification, and maintenance of these range improvements would be fully funded by the permittee or lessee. The permittee or lessee would have title to removable range improvements authorized under these permits. Priority for BLM range improvements would be given to allotments in the "I" category, including: 15.5 miles of 4-strand barbed-wire fence, 17.5 miles of net wire- fence (in non-antelope use areas), 38 new water developments, and 32.5 miles of water pipeline. The United States would have title to nonstructural or nonremovable range improvements authorized under cooperative agreements.

Vegetation treatments with BLM funds would occur on 47,022 acres west of the Pecos River as described under the DPA (see Appendix C-1 for treatments by allotment).

Existing active AMPs would be maintained including construction of new range improvements where needed. No new grazing programs would be developed.

Additional forage would be provided to big game from vegetation treatments and improved range condition. The long-term goal would be to improve big game habitat and increase herd numbers.

ELIMINATION OF LIVESTOCK GRAZING (ELG)

Under the ELG alternative, all domestic livestock grazing on public land would be discontinued; all vegetation would be available to enhance wildlife habitat, watershed stabilization, and aesthetics. Management guidelines necessary to implement this alternative include the following:

Livestock grazing would be discontinued on 993,411 acres of public land; 249,535 AUMs of grazing preference would be cancelled as current leases and permits expire. This action would amount to a reduction of 197,611 AUMs in the short term (approximately 5 years from the time of implementation, or 1992) and a 100% reduction by the year 1995. See Appendix B-5 for AUMs by allotment.

Rangeland improvement projects would be limited to those improvements which would benefit wildlife, watershed, or other resources as special appropriations are available. Existing improvements which would interfere with wildlife movements, or which would serve no useful purpose (such as fences and corrals), would be removed from public land. It is estimated that 1,300 miles of fence would be removed. Existing AMPs or other grazing programs would be eliminated.

Big game habitat would be managed to allow herds to increase to optimum numbers, or number determined by the New Mexico Department of Game and Fish (NMDG&F).

MAXIMIZATION OF FORAGE FOR LIVESTOCK (MAX)

The management direction under the MAX alternative is to initiate an intensive program of rangeland management designed to achieve maximum forage production for livestock. Under this alternative, long-term licensed use would be increased by approximately 28 percent using the following guidelines:

Short-term stocking rates would be 213,556 AUMs, reflecting the temporary deferment which would occur following vegetation treatments. Projected stocking rates in the long term would be 296,061 AUMs with increases being made in both "M" and "I" category allotments (see Appendix B-5). The increases reflect additional AUMs which would be gained through vegetation treatments, range improvements, intensive management, and increased allowable utilization.

Proposed range improvements include: 17.5 miles of 4-strand barbed-wire fence, 29.5 miles of net-wire fence (in non-antelope use acres), 80 new water developments, and 69.1 miles of water pipe-line. Range improvements and vegetation treatments would be ranked for priority by benefit/cost analysis.

Vegetation treatments would be applied to approximately 51,200 acres west of the Pecos River as follows (see Appendix C-2 for treatments by allotment):

TABLE 1-3
MAX PROPOSED VEGETATION TREATMENTS

Allotment Category	Target Vegetation and Type of Control	Acres
I	Mesquite	
	-Mechanical	1,785
	-Chemical	20,065
M	Mesquite	
	-Chemical	1,480
I	Cholla	
	-Mechanical	14,410
M	Cholla	
	-Mechanical	1,460
I	Creosote	
	-Chemical	1,970
M	Creosote	
	-Chemical	80
I	Snakeweed	
	-Chemical	8,142
I	Sacaton	
	-Prescribed Burn	650
M	Sacaton	
	-Prescribed Burn	1,230
	Total	51,272

Source: RRA Inventory Files

Intensive grazing programs would be implemented on all "M" and "I" category allotments (899,745 acres of public land), beginning with those allotments with the highest potential for improvement. When fully implemented, all allotments would, in the long term, be under a grazing program which would combine proper grazing use with scheduled rest periods such as deferred, rotation, or high-intensity-short-duration system.

Big game habitat would be managed to complement forage production for livestock.

DECREASED LIVESTOCK GRAZING (DLG)

Under the DLG, the management direction is to improve ecological range condition, enhance wildlife habitat, and protect and improve watershed conditions through livestock reductions (approximately 23 percent overall). Reductions from licensed use would be applied to "M" and "I" category allotments; "C" category allotments would not be affected due to the low percentage and scattered/isolated pattern of public land involved (refer to Figure 1, page 1-6). Management guidelines needed to implement this alternative include the following:

Grazing would be eliminated on approximately 23,500 acres of rangeland in poor ecological condition and reduced 50 percent on 340,800 acres in fair condition. Reductions would be commensurate with the proportion of rangeland (per allotment) in fair or poor condition. No reductions would occur on those acres in good or excellent condition. Grazing capacity on fair ecological condition range is estimated to be one-half the capacity of similar rangeland in good ecological condition (criteria for adjustments based on range site descriptions). Poor ecological condition rangeland is not considered to have the capacity for livestock grazing. Reductions would be taken on an allotment as a whole, resulting in decreased utilization of forage species allotment wide. An example of the method used to reduce stocking rates follows:

TABLE 1-4
EXAMPLE OF STOCKING RATE REDUCTION IN DLG ALTERNATIVE

Allotment No. 9999

ECOLOGICAL CONDITION CLASS	ACRES	CURRENT LICENSED AUMs	REDUCTION FACTOR	DLG LICENSED AUMs
Excellent	0	0		0
Good	1,500	357	0%	357
Fair	875	143	-50%	72
Poor	150	16	-100%	0
TOTALS	2,525	1516		429

Initial stocking rates, based on condition indicated from monitoring studies, would be 211,017 AUMs; by 1992 stocking rates are projected to be 175,686 AUMs and would remain at that level through the long term (see Appendix B-5).

BLM range improvement funds would be disbursed by priority and available for use only in areas where existing plans have been approved (Ft. Stanton MFP, East Chaves MFP).

Existing active AMPs would be maintained including construction of new range improvements where needed. No new plans or grazing programs would be developed. AMPs exhibiting the need for livestock reductions, based on range condition, would be amended to display revised goals and objectives. Improvement of rangeland conditions would have to occur solely through livestock reductions.

Forage produced and not used by livestock would be available to improve wildlife habitat and increase big game herd numbers.

MANAGEMENT ACTIONS COMMON TO MULTIPLE ALTERNATIVES

Table 1-5 displays management actions described in the alternatives and the alternatives to which each action applies. Descriptions of the management actions follow the table in the order shown.

TABLE 1-5
MANAGEMENT ACTIONS BY ALTERNATIVE

Action	Alternatives					
	PA	DPA	IPA	ELG	MAX	DLG
Forage Availability (Livestock)	X	X	X		X	X
Allotment Categorization		X	X		X	
Monitoring		X	X		X	X
Livestock Use Adjustments		X	X	X	X	X
Vegetation Treatments		X	X		X	
Range Improvements		X	X		X	
Grazing Programs		X			X	

Source: RRA BLM Files

Forage Availability. The RRA is presently classified as being suitable for grazing by cattle, sheep, goats, and/or horses. No pastures were found to be unsuitable for livestock grazing. All allotments are classified as being suitable for yearlong grazing and are presently authorized for such use. These classifications could be changed as future Habitat Management Plans (HMPs) for wildlife or other resource plans identify a specific need to change the kind of livestock or season of use.

Allotment Categorization. Allotments have been categorized as previously described under the planning criteria (see Appendix B for individual allotment categorizations). A total of 290,493 acres are in category "I"; 609,252 acres are in category "M". Rangeland monitoring is being conducted on "M" and "I" allotments.

Approximately 93,666 acres are in category "C", where ecological condition class has not been determined due to lack of funds, manpower, and time. Those acres are generally in scattered and isolated tracts outside of the grazing district (section 15 leases), and would be monitored if a need is demonstrated.

Monitoring. Allotments will be monitored to determine the changes in rangeland condition and trend due to changes in grazing management, vegetation treatments, and range improvements. Monitoring studies for range, watershed, and wildlife are shown in Table 1-6. In addition to individual allotment monitoring, areawide phenology studies by range site will be continued.

TABLE 1-6
RANGELAND MONITORING STUDIES

Study	Frequency	Season
Range/Watershed: a/		
Actual Use	Annually	Spring
Utilization	Annually	Spring
Precipitation	Monthly	March - October
Condition	First & Fifth years	Fall
Trend	First & Fifth years	Fall
Production	Annually	Fall
Wildlife: b/		
Fall Forbs- Pronghorn	Annually	Fall
Lizards c/	Annually	Summer
Lesser Prairie Chicken		
Lek Census	Annually	Spring
Shinnery Control	Annually	Fall

Source: BLM RRA Office Files

a/ See Appendix A-1 for methodology.

b/ See Appendix D-2 for methodology.

c/ Sanddune sagebrush, lesser earless, marbled whiptail, side-blotched, and eastern fence lizards.

Livestock Use Adjustments. Current BLM policy requires the use of comprehensive monitoring to verify the need for livestock adjustments rather than relying on one-time inventory data. In reviewing the long-term stocking rate figures (Appendix B-5), it is emphasized that the AUM figures are not final stocking rates; rather, all livestock use adjustments will be implemented through documented agreement or by decision. When adjustments are made through agreement, they may be implemented once the Rangeland Program Summary (RPS) has been through a public review period. The RPS will be issued within 5 months after the FEIS is published, and will summarize the grazing program decisions reached as a result of the planning EIS effort. It will outline the major grazing actions to be taken on the allotments within each category and will contain a proposed schedule for the issuance of decisions. When livestock use adjustments are implemented by decision, the decision will be based on range survey data, monitoring of resource conditions and operator/target group (Appendix A-2) consultation.

The Federal regulations that govern changes in allocation of livestock forage provide specific direction for livestock use adjustments implemented by decision (43 CFR 4110.3-1 and 4110.3-3). The regulations specify that acceptable data is necessary to make reductions and that permanent increases or suspensions of livestock forage "shall be implemented over a five year period unless after consultation with the affected permittees or lessees and other affected interests, an agreement is reached to implement the increase or suspension in less than 5 years."

A 5 year period for monitoring studies to collect acceptable data began in 1982, and will conclude in 1987. First-year study data indicated approximately 365,000 acres are in fair to poor range condition. Based on present data (2 years), it is expected that short-term decreases in stocking rates may be indicated by the full 5 years of study data for those areas in fair to poor condition. These adjustments would occur under the DPA, IPA, and DLG alternatives.

Monitoring studies would be continued after the initial 5-year period where determined necessary. These determinations would include areas where ecological conditions are not satisfactory, resource conflicts have developed, or management actions have been implemented. In areas where resource conditions are satisfactory and static or improving, trend studies may be sufficient.

Vegetation Treatments. Three methods of vegetation treatments are discussed in the following order: chemical brush control, mechanical brush control, and prescribed burning.

Chemical Brush Control

Four herbicides are proposed for use in controlling brush. The goal of these herbicide treatments is to decrease the target species, resulting in an increase in grass and forb production. The four herbicides proposed for use are dicamba (3,6-dichloro-o-anisic acid), picloram (4-amino-3,5,6-trichloropicolinic acid), 2,4,5-T (2,4,5-trichlorophenoxy acetic acid), and tebuthiuron(N-[5-(1,1-dimethylethyl)-1,3,4-thiadiezol-2-yl]-N,n'-dimethylurea). Two combinations of herbicides are also proposed in this statement - one is a tank mix of picloram and dicamba, the other is a mixture of 2,4,5-T and picloram. These herbicides have been labeled and approved by the Environmental Protection Agency and the New Mexico Department of Agriculture for use on rangelands in the state of New Mexico. In addition, new chemicals, such as Trichlopyr and Dowco-290, which are currently being evaluated by the U.S.EPA for labeling, would be considered for possible use if and when they are labeled. Before these chemicals would be used, a site-specific EA would be prepared. Sufficient data on these chemicals are not available, at this time, for analysis in this document.

All application rates of herbicides would be determined based on individual range sites and the conditions at the time of application. A site-specific Environmental Assessment would be prepared prior to vegetation treatments to determine the site-specific impacts. Directions for use, and precautions during use, would follow those set by the manufacturers of these four herbicides. (For more detailed information on methods to be used during application, and precautions during and after application, see the East Roswell Grazing Environmental Statement, pages 1-17 through 1-26).

Mechanical Brush Control

Tractor-mounted root-knives would be used to grub mesquite and cholla. The uprooted mesquite would be left in place after grubbing to provide wildlife habitat. Uprooted cholla would be stacked and left in place or burned, depending on wildlife or other multiple-use needs.

Prescribed Burning

Prescribed burning would be used primarily for maintenance of alkali sacaton or giant sacaton swales to remove rank and unpalatable growth. Site-specific Environmental Assessments (EAs) and burn plans would be developed for any prescribed burns.

Range Improvements. Fences, water developments, and other range improvements needed to implement grazing systems or other management plans would be designed during specific management plan development. Site-specific impacts from projects would be analyzed in an EA.

Grazing Programs. Grazing programs are written plans designed to enhance range condition by improving distribution of livestock and providing the proper use and periodic rest of available forage. These plans specify goals and objectives for grazing management and the steps required to attain the desired results on individual allotments. The development of grazing programs takes place with coordination and consultation with the livestock operator. Successful grazing programs already in use on ranches may be documented and incorporated into a plan, or CMPs may be developed with the ranch operator. Development of individual plans would not be done until after the filing of the EIS and a decision made for management of the area. Grazing programs would be developed as part of an allotment plan, with impacts analyzed in site-specific EAs.

STANDARD OPERATING PROCEDURES

The following are standard operating procedures that BLM would adopt to reduce or eliminate adverse environmental impacts and, where possible, enhance resource values.

1. Individual grazing programs would be developed in consultation with affected parties and would identify needed projects and developments.

2. A site-specific EA would be prepared for each allotment plan or individual range development.

3. Before surface-disturbing activities take place, cultural resources would be inventoried and evaluated. All reasonable efforts would be made to avoid adverse impacts on cultural resources. If impacts are unavoidable, BLM would consult with the State Historic Preservation Officer (SHPO) to develop mitigating measures.

4. The cultural resource program would properly identify those areas which are sprayed with chemical herbicide so that future excavators of those areas would be informed of the possibility of contamination of radiocarbon samples. This information would then become a part of the antiquities permit issued for the excavation of that site.

5. Prior to the implementation of surface-disturbing activities, paleontological resources would be inventoried and evaluated.

6. Areas meeting riparian and wetland habitat criteria would be assessed to determine if protection is needed to provide wildlife habitat. Protection measures would be selected for individual situations to include protective fencing, adjustments in livestock use, and/or establishment of buffer strips, as necessary.

7. Where domestic livestock are excluded from riparian areas, alternate water sources for livestock would be provided.

8. Where BLM controls water sources, water would be made available to wildlife when livestock are on and off the allotments or pastures; escape ramps would be required in all water troughs and open storage tanks.

9. Fences designed for construction in big game use areas would meet BLM fencing specifications (BLM Manual 1737), unless otherwise authorized. Fences authorized by cooperative agreement or range improvement permits would be subject to modification to achieve management objectives deemed necessary by the authorized officer.

10. Selection of specific sites for range improvements would be evaluated to ensure that highly erosive areas are avoided and to insure workability of the project.

11. Where soils and vegetation are disturbed, reclamation measures would be taken, if applicable. These measures include returning the land to as near its natural form as possible and reseeding with mixtures of grass, legumes, and forbs to prevent erosion.

12. Application of herbicides would be in conformance with BLM Manual 9220 and State of New Mexico and U.S. Environmental Protection Agency (USEPA) standards. Herbicides proposed for use would be authorized by the USEPA, the New Mexico Department of Agriculture (NMDA), and the DOI, and must be registered by the USEPA and NMDA. NMDA restricted use regulations would be consulted prior to any herbicide application.

13. On sprayed or grubbed areas, livestock would be excluded for a minimum of two consecutive growing seasons.

14. Important wildlife habitat, such as broadleaf tree groves, aquatic and riparian sites, dirt tanks, watering tubs, active raptor nests, and the areas around them would be protected during brush control operations. These areas would be protected through the use of nonlethal rates of herbicides, or other means as deemed appropriate by resource specialists. Pseudoriparian areas and most major drainages, would be excluded from chemical treatment. Drainages containing perennial streams would be excluded from chemical treatment programs within a distance of 1,320 feet.

15. In areas of shinnery oak control, 20 to 30 percent of existing shinnery would be left for wildlife. The desired percent of uncontrolled shinnery could be attained by either applying the herbicide at a rate designed to achieve 70 to 80 percent kill or leaving interspersed areas of uncontrolled shinnery.

16. A threatened, endangered, State-listed, or proposed-listed species clearance would be conducted by an appropriate BLM staff biologist prior to the beginning of any project. If a "may affect" determination is made by the staff biologist, consultation would be undertaken with the U.S. Fish and Wildlife Service (USFWS), New Mexico Department of Game and Fish (NMDG&F), or the New Mexico Natural Heritage Program (NMNHP) listing the species which may be affected. The results of the consultation would determine the course of action necessary to avoid adverse effects on listed species.

17. New or expanded grazing use and support facilities would be evaluated on a case-by-case basis so that impairment of wildlife habitat would be minimized.

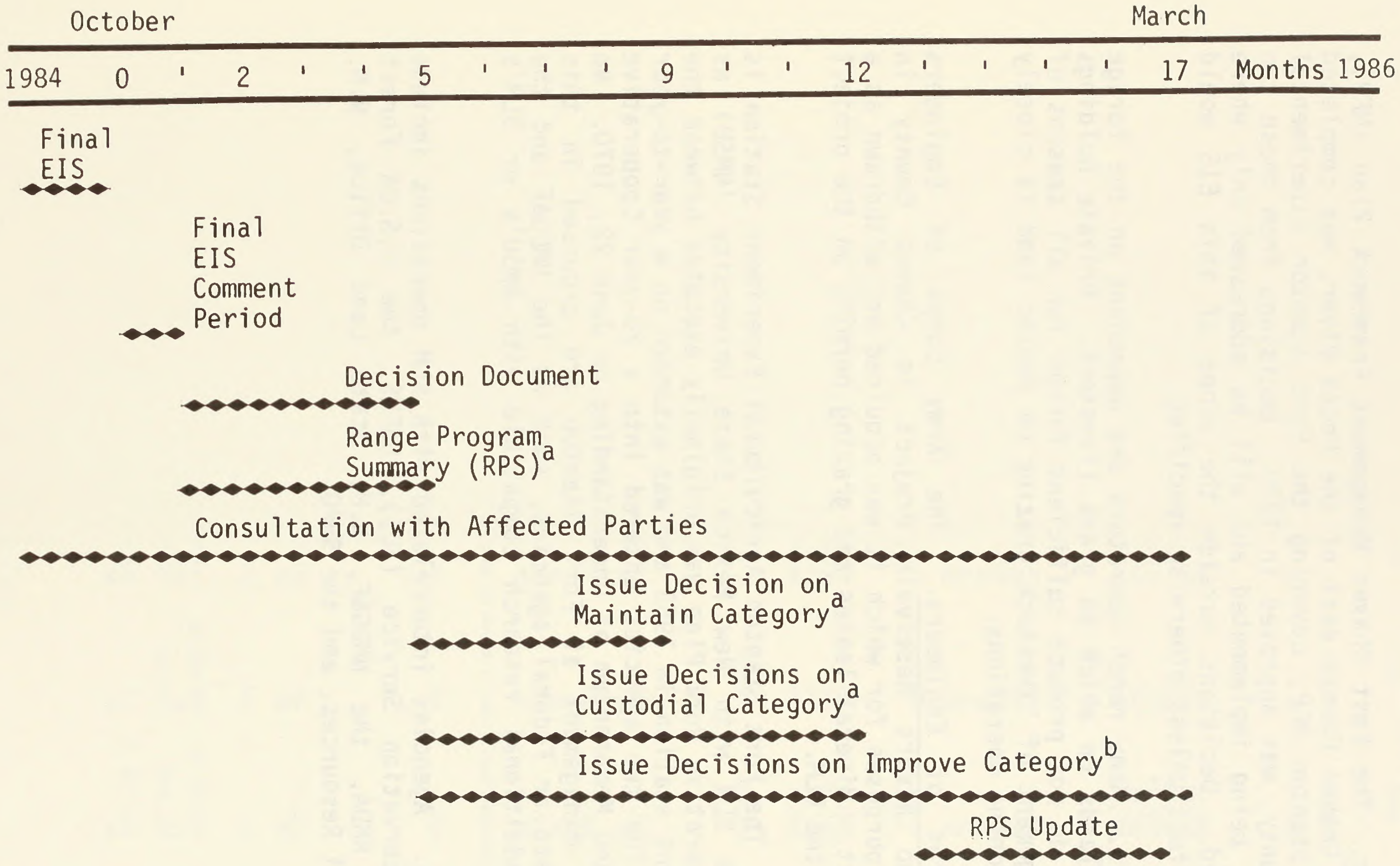
18. Evaluation, ranking, and budgeting of rangeland improvements would be in accordance with the Final Rangeland Improvement Policy, Washington Office Instruction Memorandum-83-27.

19. A fire-management plan and EA would be developed prior to any prescribed burning of vegetation.

IMPLEMENTATION SCHEDULE

Figure 2 diagrams the general implementation schedule. In areas where monitoring studies have produced acceptable data indicating an adjustment in AUMs is needed, increases or suspensions would be implemented over a maximum of 5 years, with adjustments taking place in the first, third, and fifth years. During this period, monitoring would be used to determine if the full amount of the proposed adjustment is necessary. Increases or suspensions would be phased in over a period of less than 5 years where an agreement can be reached.

No schedule is proposed for implementation of grazing programs or vegetation treatments. Under the selective management policy, allotments would be ranked to receive improvements based on categorization, favorable returns, and resource need. Site-specific EAs would be prepared for all grazing programs, range improvements, and vegetation treatments prior to implementation.



[a] If consultation results in substantial changes from actions outlined in the RPS, issuance of decisions will be deferred until after the RPS update.

[b] Decisions requiring more than 17 months to issue will be identified in the RPS update. The RPS update will give the reason for the extended time period and describe further actions needed to issue decisions by a specified date.

FIGURE 2

General Implementation Schedule

INTERRELATIONSHIPS

Previous Plans. The East Chaves Management Framework Plan (MFP), which covers all of Chaves County east of the Pecos River, was completed in 1980; the Fort Stanton MFP, covering the Fort Stanton Experimental Range in Lincoln County, was approved in 1970. Decisions from these two plans are currently being implemented and will be addressed only where changes are proposed. Decisions outside the scope of this EIS would continue to be in effect unless otherwise specified.

Ranch Operators. Many ranch operators are dependent on the forage provided by public lands on which to graze livestock. Private holdings of many ranch units do not produce sufficient forage for all seasons of the year. The management of livestock grazing on public land is closely related to local ranching operations.

The Army Corps of Engineers. The Army Corps of Engineers administers the Two Rivers Reservoir Project in Chaves County in accordance with the purposes for which it was acquired and withdrawn as a flood control project. Mineral leases and grazing permits on the project are administered by the BLM.

Fort Stanton. The Fort Stanton Agricultural Experiment Station is administered by the BLM with New Mexico State University (NMSU) as cooperators. A Cooperative Work Plan was originally executed between the BLM and the experiment station in 1963 and was extended on a year-to-year basis until 1970. The two agencies entered into a 20-year Cooperative Research Agreement and Memorandum of Understanding on June 22, 1970. No changes in program management at Fort Stanton are proposed in this document. Other State or Federal agencies, such as the NMDG&F and the USDA, may conduct additional research compatible with NMSU's or BLM's programs.

Other Agencies. Agencies interrelated with BLM operations include the U.S. Soil Conservation Service (SCS), USFWS, the U.S.DA Forest Service (FS), the NMDA, the NMDG&F, N.M. State Land Office, N.M. Department of Natural Resources, and the SHPO.

EQUENCES

ong erm	MAX Short Term	MAX Long Term	DLG Short Term	DLG Long Term
0	220,871	296,061	175,686	175,686
2%	8%	-1%	NC	2%
3,666	NC	93,666	NC	93,666
5,332	Dec	20,262	NC	25,332
0,201	Dec	408,086	Inc	774,939
5,210	Inc	447,895	Dec	47,922
5,500	Dec	18,798	Dec	28,050
3,502	Dec	4,704	NC	23,502
NC	Inc	10%	NC	NC
-9%	Dec	-9%	Dec	-9%
-37%	Inc	20%	Dec	-19%
NC	NC	NC	NC	NC
NC	NC	NC	NC	NC
NC	NC	NC	NC	NC
c ft/ i/yr	Dec	.30 ac ft/ sq mi/yr	Dec	.35 ac ft/ sq mi/yr
0,605	Inc	61,605	Inc	60,605
6,795	Inc	787,795	Inc	786,795
0,143	Inc	131,143	Inc	130,143
5,868	Dec	12,868	Dec	15,868
0	220,900	296,100	211,000	175,700
+	-	-	NC	NC
2,435	Dec	1,700	Inc	2,179
NC	NC	NC	NC	NC
512	Dec	240	Inc	436
NC	NC	NC	NC	NC
NC	NC	NC	NC	NC
Inc	Dec	Dec	NC	NC
NC	NC	NC	NC	NC

ion to avoid a "may-affect" determination.

Inc	Dec	Inc	Inc	Inc
+	-	-	+	+
+	-	-	+	+
4,196	Dec	51,523	Inc	64,618
NC	NC	NC	NC	NC
Inc	Dec	NC	NC	Inc
3,691	$5,929,598	$7,104,324	$4,855,740	$4,855,740
-230	-6	63	-70	-70
3,000	-$42,000	$442,708	-$486,575	-$486,575
5,874	Dec	$732,039	Inc	$827,090
NC	NC	NC	NC	NC

d tracts

CHAPTER 2

AFFECTED ENVIRONMENT

HOW TO READ CHAPTER 2

Chapter 2 describes the current status or condition of the physical, biological, social, and economic factors which might be affected by activities of any one of the alternatives. Descriptions of the following resource components begin on the pages shown:

page no.

VEGETATION 2-1

LIVESTOCK GRAZING 2-5

SOILS/WATERSHED 2-7

WILDLIFE 2-12

THREATENED AND ENDANGERED PLANTS AND ANIMALS 2-20

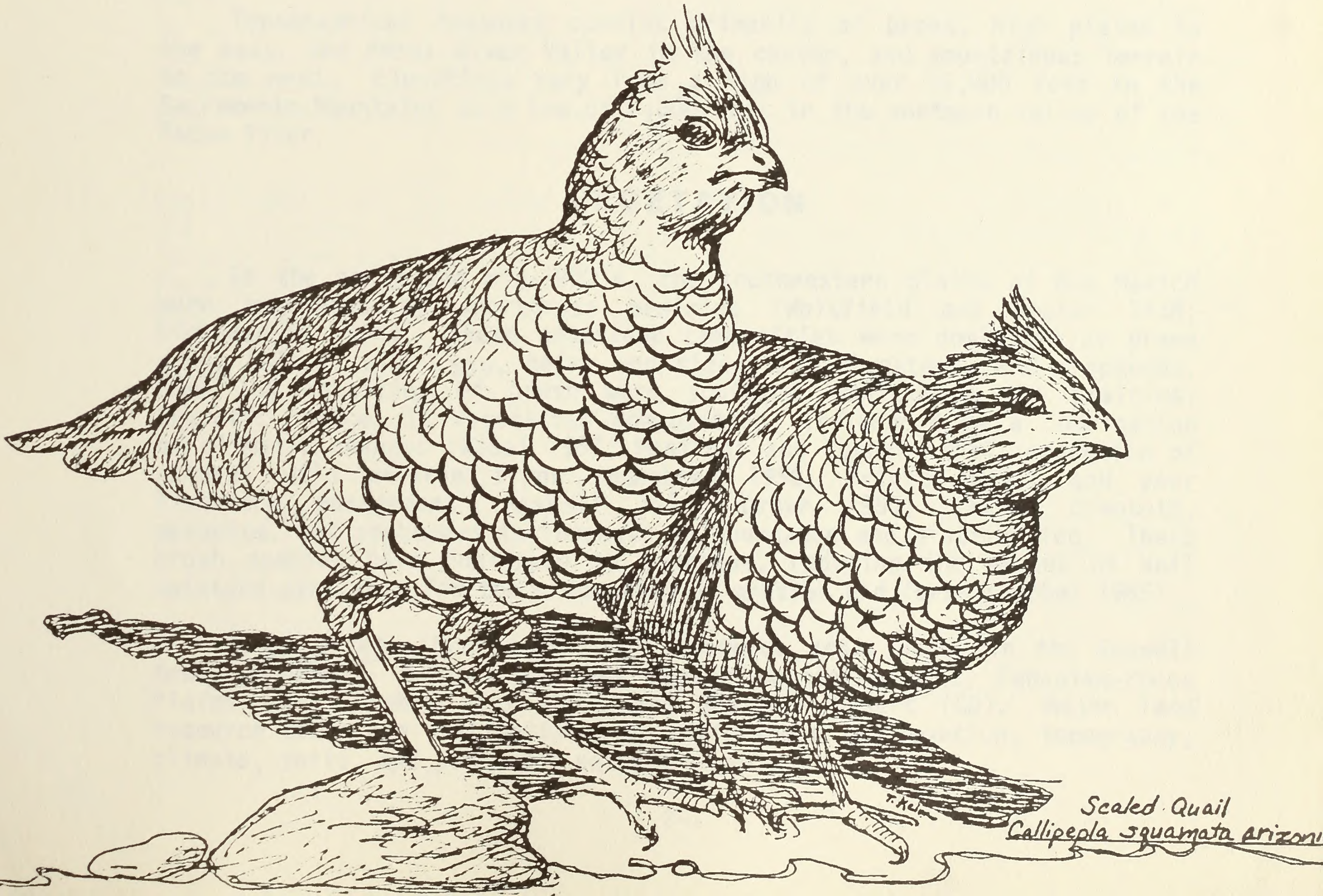
AIR QUALITY 2-21

CULTURAL RESOURCES 2-22

RECREATION 2-23

VISUAL RESOURCES 2-24

SOCIOECONOMIC CONDITIONS 2-26



Scaled Quail
Callipepla squamata arizoni

CHAPTER 2

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter describes the existing environment of the Roswell Resource Area which would be affected by implementation of any of the described alternatives. Those components of the environment which would not be affected by any of the proposed actions, specifically geology, minerals, paleontology, and urban land use, will not be discussed. A brief discussion of the climate and topography is included to provide the setting of the area. The components of the environment discussed in more detail are vegetation, livestock grazing, soils, watershed, wildlife, air quality, cultural resources, recreation, visual resources, and socioeconomics.

Setting

The climate of the area can be generally classified as semiarid with an average growing season ranging from 195 days in the eastern plains to 154 in the mountains to the west (USDI, BLM 1970, 1979); maximum summer temperatures frequently exceed 100 degrees F., while minimum winter temperatures occasionally drop below 0 degrees F. The majority of precipitation, averaging 10 to 12 inches a year, occurs during the months of June through September. Snowfall may occur from November through April, however, it usually melts within a short time.

Topographical features consist primarily of broad, high plains to the east, the Pecos River Valley in the center, and mountainous terrain to the west. Elevations vary from a high of over 12,000 feet in the Sacramento Mountains to a low of 2,800 feet in the southern valley of the Pecos River.

VEGETATION

In the early and mid-1800's, the southeastern plains of New Mexico were vegetated by shortgrass prairies (Whitfield and Beuter 1938; Dick-Peddie 1965). These grassland communities were dominated by grama grass (black, blue, gyp, hairy and sideoats), bluestems, and dropseeds. Some low densities of brush were scattered throughout the prairies. Dramatic changes in vegetation composition, influenced by a combination of climatic changes (Wedel 1957; Hastings and Turner 1965), cessation of natural wild prairie fires (Humphrey 1952; Wright 1974), and poor livestock management (Haskell 1945; Brown 1950) caused creosote, mesquite, and snakeweed to increase in abundance and distribution. These brush species have continued to increase, reducing the amount of soil moisture available for the production of grasses and forbs (Herbel 1965).

Range Sites. Four major land resource areas occur in the Roswell Resource area - Arizona and New Mexico Mountains (AN), Canadian-Pecos Plains (CP), High Plains (HP), and Southern Desert (SD). Major land resource areas are distinguished by differences in elevation, topography, climate, soils, and potential natural vegetation.

The vegetation that will occur in an area is closely related to distinct units known as range sites. A range site in the "absence of abnormal disturbance and physical site deterioration has the potential to support a native plant community typified by an association of species different from that of other sites" (Society for Range Management 1974).

A number of range sites occur within each major land resource area. A range site occurring within two different major land resource areas will differ in vegetation production as well as the proportion of species present. For analysis purposes, the range sites that were inventoried in the planning area (Appendix A-3) were grouped together in seven major range categories based on similarities in soils and vegetation (Map 2-1).

RANGE SITE CATEGORIES

Loamy. Blue grama, black grama, sideoats grama, galetta, and tobosa are typically the dominant grass species of the potential plant community in this category. Winterfat, four-wing saltbush, and yucca are the principal shrubs. Forbs include croton and desert holly. Brush species such as snakeweed, mesquite, and cholla cactus increase as the ecological condition decreases. The loamy category covers approximately 294,000 Federal acres, or 30 percent of the inventoried area.

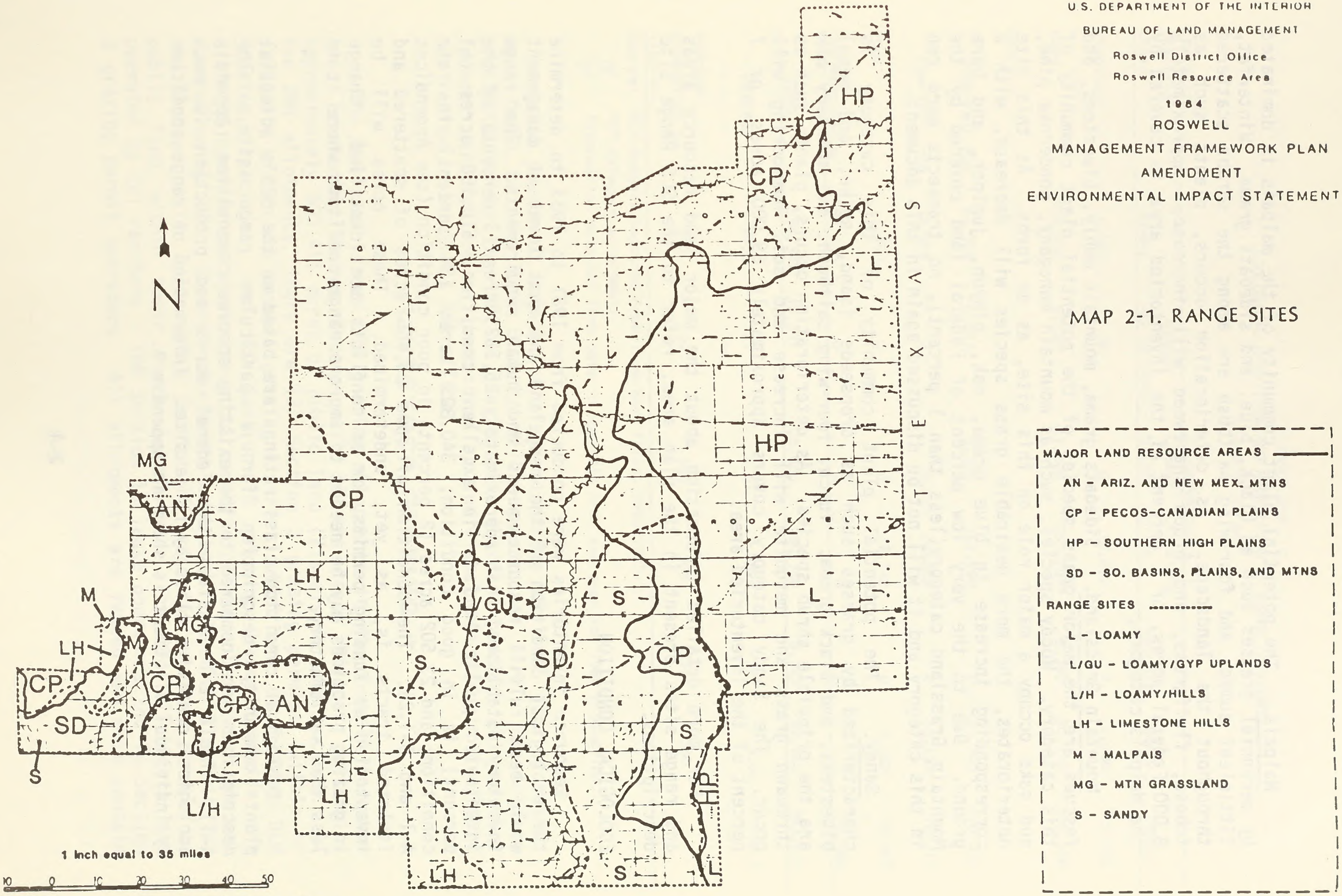
Loamy/Gyp Uplands. This range category is a complex of the loamy range category and the gyp upland range category. Indicator plants for the loamy range category were discussed above. The potential plant community of the gyp uplands category consists of gyp grama, gyp dropseed, blue, and black grama grasses, and the forb, coldenia. Shrubs and forbs are a minor component of the plant community. This site is easily damaged by heavy grazing pressure which causes a loss in cover and deterioration of the plant community to solely gyp grama, gyp dropseed, and coldenia. The Loamy/Gyp Uplands category covers approximately 15,000 Federal acres, or 2 percent of the inventoried area.

Loamy/Hills. This category is a complex of the loamy range category (25 percent) and the hills range category(75 percent). The grama grasses (blue, black, and sideoats) are the three main grasses which make up the potential plant community. Oaks, junipers, and pinyons prevail as the overstory on the cooler north and east slopes. Forb composition is minor. As this site deteriorates there is a decrease in grasses, and a corresponding increase in shrubs and bare ground. The Loamy/Hills category covers approximately 26,000 Federal acres, or 3 percent of the inventoried area.

Limestone Hills. The potential plant community of this category consists primarily of grasses such as black grama, sideoats grama, metcalf mulhly, mountain muhly, and tridens. Yucca, sacahuista, mariola, and catclaw mimosa become more prevalent on north and east slopes. In deteriorated condition, this site will show an increase in woody plants and grasses, such as threeawns and tridens. Approximately 580,000 Federal acres, or 58 percent of the inventoried area is covered by the Limestone Hills category.

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Roswell District Office
Roswell Resource Area
1984
ROSWELL
MANAGEMENT FRAMEWORK PLAN
AMENDMENT
ENVIRONMENTAL IMPACT STATEMENT

MAP 2-1. RANGE SITES



SOURCE: ROSWELL BLM DISTRICT FILES

Malpais. The potential plant community of the malpais is dominated by perennial grasses such as black, blue, and sideoats grama. Winterfat, littleleaf sumac, and four-wing saltbush are among the shrubs scattered throughout the landscape. As deterioration occurs, plants such as tobosa, fluffgrass, and broom snakeweed will increase. Approximately 8,000 Federal acres, or 1 percent of the inventoried area is covered by the Malpais category.

Mountain Grassland. Sideoats grama, mountain muhly, bluestems, and fescues are the major grass species of the potential plant community of this category. Woody species, such as mountain mahogany, ponderosa pine, and oaks occupy a major role on this site, as do forbs. As this site deteriorates, the more desirable grass species will decrease, with a corresponding increase in blue grama, oak, pinyon, juniper, and bare ground. Due to the very low percent of Federal land covered by the Mountain Grassland category(less than 1 percent), no transects were run in this category and it will not be discussed again in this document.

Sandy. The potential plant community of this category is characterized by grasses such as dropseeds (sand, spike, and mesa) bluestems, and black grama. Yucca, four-wing saltbush, and shinnery oak are the principle shrub species. As deterioration occurs, plants such as threeawn grass and mesquite will increase and soil hummocking will occur. The Sandy category covers approximately 69,000 acres, or 7 percent of the inventoried area.

For more detailed information about the major land resource areas and range sites present in the plan area, refer to the SCS Range Site descriptions.

ECOLOGICAL CONDITION

Resource inventories were conducted from 1981 to 1983 to determine the ecological condition of the rangeland and what level of management would best fulfill resource needs and human requirements. The range inventory established that approximately 25,332 acres (3 percent) of the inventoried public land is in excellent condition; 510,108 acres (51 percent) is in good condition; 340,803 acres (34 percent) in fair condition; and 23,502 acres (2 percent) in poor condition (see Appendices A-1 and B-1,2). The condition of some 93,666 acres of scattered and isolated tracts is, as yet, undetermined. These acres will be inventoried as funding permits, or as conflicts are identified. Change in grazing practices may be needed to improve range condition where it is less than satisfactory.

Ecological condition class ratings are based on the SCS's potential plant community description for a particular range site. The descriptions were compared to the existing species composition (Appendix A-1). Table 2-1 displays the Federal acres and production in each ecological condition class by range site. Information on range condition by individual allotment is shown in Appendix B.

TABLE 2-1
ECOLOGICAL CONDITION AND PRODUCTION BY RANGE CATEGORY
(Federal Acres)

Ecological Condition Class	Loamy	Loamy/ Gyp Uplands	Loamy/ Hills	Limestone Hills	Malpais	Sandy	TOTAL
Excellent	4,160	0	0	19,892	0	1,280	25,332
Good	108,436	9,124	17,800	335,585	8,393	30,770	510,108
Fair:							
High-fair +38	67,764	6,227	8,200	167,599	0	20,303	270,093
Low-fair -38	18,855	0	0	39,362	0	12,493	70,710
Poor	1,480	0	0	17,742	0	4,280	23,502
Undetermined a/	93,666	0	0	0	0	0	93,666
TOTAL	294,361	15,351	26,000	580,180	8,393	69,126	993,411
PERCENT	29.6	1.5	2.6	58.4	.8	7.0	100.0
Average Production b/ (lbs/ac)	359	199	540	305	331	380	

Source: BLM Roswell Resource Area inventory files, 1982-1983.

a/ "C" category allotments.

b/ Information obtained from data in Appendix A-3, averaged for 1982 production.

Total pounds of vegetation produced during the 1982 growing season were found to vary from 87.6 to 1178.6 pounds per acre. The average precipitation for the 1982-83 grazing year (March 1-February 28) was 10.0 inches. Information on production by individual transect is available for review in the BLM's RRA office.

LIVESTOCK GRAZING

The BLM administers 284 grazing allotments in the Roswell Resource Area (excluding Chaves County east of the Pecos River), containing approximately 993,411 acres of public land (Visuals in back pocket). Of the 284 allotments, there are 127 Section 3 grazing permits (within or partially within the Roswell grazing district) which have established BLM grazing capacities, and 170 Section 15 grazing leases (outside the district boundaries) where livestock numbers for the entire ranch are not controlled by BLM. Several allotments have both a Section 3 permit for the blocked public lands and a Section 15 lease for isolated parcels of public land within their ranch boundaries. The 284 allotments are operated by 221 ranchers - 145 Section 15 lease operators and 76 Section 3 grazing permit operators. All allotments are fenced and most contain intermingled unfenced parcels of State, private, and public lands. Most allotments are divided into pastures with water developments in each pasture. The allocated preference is 249,535 AUMs for livestock. Average licensed use for the last 5 years has been 228,656 AUMs, or 92 percent of preference. The two main kinds of livestock authorized to graze on public lands are cattle and sheep as well as a small percentage of goats and horses. Under the current management situation 80 percent of the allotments, excluding those allotments with small percentages (less than 30 percent) of public lands, are in high-fair or better condition. All allotments were determined to be suitable for grazing by domestic livestock.

Table 2-2 shows the existing percent cover by range category based on the resource inventories established in 1981.

TABLE 2-2
PERCENT COVER BY RANGE CATEGORY a/

Range Category	Percent Cover Vegetation Cover	Litter	Total
Loamy	27.8	31.8	59.6
Loamy/Gyp Uplands	21.4	31.0	52.4
Loamy/Hills	35.7	28.9	64.6
Limestone Hills	22.5	17.7	40.2
Malpais	14.7	19.1	33.8
Sandy	15.1	40.2	55.3

Source: BLM Roswell Resource Area Inventory Files, 1981-1982.
a/ Information Obtained from Data in Appendix A-3.

AMP allotments are managed on a deferred or rest rotation grazing schedule, set up in cooperation with individual permittees. The schedules allow for deferment of one or more pastures during the growing season each year. Sixteen allotments, shown below, are under Allotment Management Plans (AMPs).

Allotment	Category
3011 - Roadrunner Ranches	M
3035 - Circle F Ranch	M
3048 - Mike Corn	I
3076 - Bill Shrecengost	I
4002 - Roy Gunter, Jr.	M
4018 - Kap Kelley	M
4020 - Tom Corn	M
4028 - Mike Corn	I
4029 - Childress Ranch, Inc.	M
4031 - Mark Draper	M
4032 - Glaze Sacra	I
4041 - Ruth Corn	M
4044 - Bronson Corn	M
4046 - Tom Cooper	I
4066 - Diamond A	M
4071 - Jack Price, Est. (Savory Grazing Method)	C

Flexible stocking rates can be worked out with the permittee to take advantage of additional forage during years with above-average rainfall or, if necessary, temporary nonuse during drought years. Poor distribution of livestock is evidenced when uneven utilization patterns within pastures are noted. Livestock move over any pasture in response to the number and location of watering facilities, topography, forage, and size of pasture (Herbel and Gould 1980). Additional waters, salting, protein supplements, fencing, shading, and rubbing posts can be used to improve livestock distribution.

SOILS/WATERSHED

Soils vary from shallow in the western portion of the planning area to deep along the Pecos River. The shallow soils occur on rolling hills, and are generally less than 20 inches in depth. The rocky nature of the soil, coupled with shallow depth, increases run off which increases the water erosion hazard in the associated draws and drainages.

The soils influenced by the Pecos River outside of the flood plain, are on level to moderately sloping topography and have varied textures. High concentrations of calcium and gypsum carbonates (caliche) occur in the substratum. These soils are moderately susceptible to water erosion and highly susceptible to wind erosion. Soils influenced by the Pecos River inside the flood plain are formed by the deposition of soil by the river and the textures vary from clayey to sandy. Since both water erosion hazard and wind erosion are highly dependent on the texture of the soil, the erosion hazard varies from high to low.

The planning area contains 33 range sites which have been combined into 7 range site categories. The range sites were combined based on similar soils and responses to management actions.

Phase 1 watershed surveys were conducted in the past in selected watersheds to determine the erosion condition. Soil surface factor ratings were given to rate the erosion condition (See Appendix D-1 for soil surface factor methodology). Approximately 6 percent of the area or about 60,000 acres, is in the stable erosion class; 79 percent, or about 790,000 acres, is in the slight erosion class; 13 percent, or approximately 130,000 acres, is in the moderate erosion class; and 2 percent, or 20,000 acres, is in the critical erosion class. The range inventory indicated the current watershed trend is improving on all but 1 percent of the inventoried area. The remaining 1 percent (approximately 10,000 acres) is in a static trend.

Climate, topography, ground cover, and physical properties (texture, coarse fragments, restrictive layers, etc.) are primary factors influencing the amount of sediment transported by runoff water. Estimates of the sediment yields for the range site categories were made by using the Pacific Southwest Interagency Committee (PSIAC 1968) methodology (See Appendix D-2). Table 2-3 exhibits the sediment yield class for each range site category.

TABLE 2-3
RANGE SITES BY SEDIMENT YIELD CLASSES

Stable (0 to 0.2 ac.ft./ sq.mi./yr.)	Slight (0.2 to 0.5 ac.ft./sq.mi./yr.)	Moderate (0.5 to 1.0 ac.ft./sq.mi./yr.)
Limestone Hills (580,180 ac)	Loamy (294,361 ac)	Loamy/ Gyp Uplands (15,351 ac)
Malpais (8,393 ac)	Sandy (69,126 ac)	
	Loamy/Hills (26,000 ac)	

Source: Roswell District BLM Files

Surface texture, coarse fragments, moisture content, and amounts of calcium salts in the soil are primary factors influencing soil erodibility by wind. Soils having similar properties that effect their resistance to blowing make up a Wind Erodibility Group (WEG). WEGs rate soils on a scale of 1 to 8 (see Appendix D-3). Sandy soils rate 1 because of less resistance to wind erosion. Clayey and stoney soils rate 8 because they have the greatest resistance to wind blowing. The WEG estimations are listed in Table 2-4 for the major range site categories.

TABLE 2-4
RANGE SITE WIND ERODIBILITY GROUPINGS

Range Site	WEG
L/H - Loamy/Hills	6 Moderate soil blowing hazard
L - Loamy	5 Moderate soil blowing hazard
L/GU - Loamy/Gyp Upland	4 High soil blowing hazard
LH - Limestone Hills	8 Slight soil blowing hazard
M - Malpais	8 Slight soil blowing hazard
S - Sandy	1 Very high soil blowing hazard

Source: US SCS Soil Survey Reports

RANGE SITE CATEGORIES

Loamy. This category occurs on level to gently sloping peidmont slopes, plains terraces, alluvial fans, and drained floodplains. The degree of slope ranges from 0 percent to 10 percent but average about 5 percent. These soils occur at elevations which range from 2,850 feet to 7,000 feet, and vary in texture from fine sandy loams to clayey loams. Depth ranges from moderately deep (approximately 40 inches in depth) to deep (40+ inches or more).

These soils are generally in the slight sediment yield class and have a moderate wind erosion hazard. Since these soils do not erode easily after treatment, mechanical manipulation of the vegetation and installation of pipelines and fences is not limited. Chemical vegetation treatments and prescribed burning also are not limited.

Loamy/Gyp Uplands. This range site category is a complex of the same loamy soils in the loamy range site plus shallow soils (generally less than 8 inches) over gypsum materials. This category site occurs on level to gently sloping plains and terraces. The characteristics of the loamy component are identical to those described for the loamy range site category. The gyp upland component consists of soils with textures ranging from loam to fine sandy loam overlying dense layers of gypsum materials.

The gyp upland soils have a moderate sediment yield classification and a high wind erosion hazard. Mechanical treatments expose the underlying gypsiferous soils to erosion. Mechanical disturbance of the soils presents a moderate erosion hazard. The suitability of these soils for the installation of fences and pipelines is moderately limited due to the erosion hazard and shallowness.

Loamy/Hills. This range site category is a complex of the loamy range site and the hills range site. It occurs on rolling to steep hills and mountain footslopes. Characteristics of the loamy component are identical to those described for the loamy range site category. Slopes range from 15 to 75 percent, with an average of 20 to 30 percent. Soils are shallow to moderately deep over acid igneous bedrock. Textures vary from loam-sandy loam to clay loam and are generally stony, gravelly, or cobbly. These soils are in a slight sediment yield class and have a moderate wind erosion hazard. Due to the steep slopes and the moderate wind erosion hazard, reduction of cover by either mechanical or chemical means or by prescribed burning is moderately limited. Due to the steep slopes, installation of pipelines is also moderately limited.

Limestone Hills. This category occurs on level to steep sloping hills, mountains, upland plains, peidmont slopes, and mesas. Slopes vary from 0 to 75 percent but generally average about 10 percent. The soils in this category vary in texture from fine sandy loam to cobbly loams and are shallow, generally less than 20 inches deep, over limestone bedrock.

These soils are generally in the stable sediment yield class and have a slight wind erosion hazard. Mechanical disturbance of the soil surface exposes the soil to severe wind and water erosion. Due to the severe erosion potential and shallowness of the soils, mechanical manipulation of the vegetation and installation of pipelines is severely limited. The installation of fences is moderately limited due to the shallow soil depth. Chemical treatment of vegetation and prescribed burning does not increase the erosion hazard and, therefore, is not limited.

Malpais. The Malpais range site category occurs on nearly level to steep terrain interrupted by basalt outcrops, rocks, and occasional boulders. Slopes range from 0 percent to 25 percent but generally average about 5 percent. The soil textures in this category vary from stony clay to stony fine sand which is generally shallow and well-drained. These soils are in a stable sediment yield class and have slight wind erosion hazard.

Due to the shallow soil depth, mechanical vegetation manipulation and the installation of fences and pipelines is severely limited. Chemical control of vegetation and prescribed burning is not limited.

Sandy. This range site category occurs on level to gently sloping upland plains, terraces, peidmont slopes, and plains. Slopes range from 0 percent 10 percent but average about 2 percent. The soil textures in this category range from fine sandy loam to loamy fine sand. The depth of these soils ranges from moderately deep (approximate 40 inches) to deep (40+ inches plus). In the deeper sandy sites, wind erosion has formed hummocks (dunes around shrubs) separated by level sparsely vegetated interspaces. These soils are in a slight sediment yield class and have a very high wind erosion hazard.

Due to the very high wind erosion hazard, reductions in ground cover by mechanical or chemical means or by prescribed burning are severely limited. Other surface-disturbing activities, such as installation of fences or pipelines, are moderately limited.

WATER

Surface Water. Approximately 8 percent of the Resource Area is in the Canadian River Basin, 4 percent in the Red River Basin, 2 percent in the Lea Plateau, 8 percent in the Brazos River Basin, 8 percent in the Tularosa Basin, and 70 percent in the Pecos River Basin. The majority of the public lands are in the Pecos River Basin and the Tularosa Basin, so the discussions will center primarily around these. The locations of these surface water basins can be found on Map D-a in Appendix D. The Pecos River Basin is the major surface water basin in the planning area and covers an area of 25,922 square miles which extends from the Sangre de Cristo mountains of north central New Mexico to the Texas state line, a distance of about 435 miles. Some of its major tributaries include Salt Creek, Rio Hondo, Rio Felix, and Long Arroyo. These drainages flow only in response to precipitation. The Pecos River Basin and the planning area contain large areas of gypsum karst topography which reduces runoff to streams. Karst refers to topography formed over limestone, dolomite, or gypsum where there are sinkholes, caverns, and lack of surface streams.

The estimated mean annual runoff for the planning area ranges from 5 inches in the mountains to 0.1 inch in the valleys and plains. Intense thunderstorms from July through September generally contribute about 60 percent of the annual precipitation.

The SCS methodology for determining storm runoff from rainfall was used to develop a surface runoff model to predict peak flows. The method is based on soil infiltration rates and soil moisture content. The infiltration rates are based on soil type and land use. Table 2-5 shows existing peak flows for the range sites in the planning area. See Appendix D-4 for the criteria used in determining the peak flows when assessing the impacts of the various alternatives.

Surface Water Quality. In general, surface water quality deteriorates as the Pecos River flows downstream. The dissolved solids content increases to the point that the water quality is marginal in some places. The major cause of the poor water quality is due to the soluble nature of the water bearing formations and the surface materials in the watersheds. The better quality waters can be found in the tributary streams and from floodflows and precipitation.

TABLE 2-5
MAGNITUDE OF FLOOD RUNOFF IN THE ROSWELL RESOURCE AREA a/

Range Site	2 Year (flood)	10 Year (flood)
Loamy	24.9	93.5
Loamy/Gyp Upland	75.6	256.0
Loamy/Hills	0	11.8
Limestone Hills	81.6	234.0
Malpais	0	0.0
Sandy	0	3.13

Source: Storm runoff model, R. H. Hawkins, Utah State University

a/ Values are peak runoff in cubic feet per second per square mile from a 6 hour duration storm on a mile-square watershed with a reoccurrence interval of 2 and 10 years.

Surface water quality standards have been adopted by the New Mexico Water Quality Control Commission to protect and sustain designated uses. General standards apply at all times to all surface waters of the State which are suitable for recreation and support of desirable aquatic life presently common in New Mexico. Specific standards for individual stream segments and tributaries in the planning area are listed in Appendix D-5.

Generally, the quality of surface water is within the designated standards for the Pecos River and seldom exceeds the standards. Very little water quality data is available for tributary streams.

Groundwater - Quantity. Sedimentary rocks (chiefly unconsolidated sand and gravel, limestone and sandstone) are the important aquifers in the Pecos River Basin. The alluvial aquifers are generally stream connected and usually recharged by local precipitation and floodflows. While the supply of water in the upper aquifers is generally known, little is known about the quantity and quality at depth. Map D-b displaying estimated potential yield of water wells in the planning area can be found in Appendix D.

The average depth to groundwater is less than 200 feet over 50 percent of the area. Areas exist where the depth exceeds 500 feet. Refer to Map D-c in Appendix D for a general overview of the depth of groundwater.

The New Mexico State Engineer has the authority to supervise the appropriation and use of surface water and groundwater. When an underground water basin is declared by the State Engineer, he assumes jurisdiction over the water appropriations. All or part of six declared underground water basins are present in the planning area (see Map D-d in Appendix D). An application must be filed with the State Engineer and a permit obtained to appropriate water from these declared basins.

Groundwater - Quality. Groundwater in the Pecos River Basin generally contains more than 1,000 milligrams per liter of total dissolved solids, with some aquifers having concentrations greater than 35,000 milligrams per liter. Water containing 1000 to 3000 milligrams per liter of total dissolved solids is frequently used for industrial, irrigation, and domestic uses where better quality water is not available. In the Carrizozo area of the Tularosa Basin, the water is generally hard and also high in dissolved solids.

The New Mexico Water Quality Control Commission has established general standards for groundwater containing 10,000 milligrams per liter or less of total dissolved solids. These standards are listed in Appendix D-6 and apply unless they are exceeded by existing conditions or unless otherwise provided for in the regulations. In addition, there are regulations for controlling discharges onto or below the ground surface to protect all groundwater which has an existing concentration of 10,000 milligrams per liter of total dissolved solids or less for present and potential future uses.

A limited number of water quality samples taken in the planning area indicates generally acceptable water quality for most livestock and wildlife consumption (Appendix D-7). There are instances where the recommended standards for hardness, chlorides, sulfates, and trace metals have been exceeded. Due to the high dissolved solids content and the amount of sulfate, much of the water in the planning area would be unacceptable for human consumption.

WILDLIFE

Species diversity is high in the planning area due to the influence of the High Plains/Chihuahuan Desert ecotone extending through it. Wildlife habitat in the area is influenced by the Sacramento and Capitan Mountains to the west, the Chihuahuan Desert to the south, and the Plains to the north and east. Wildlife is most diverse in riparian sites and drainages containing trees and other shrubby vegetation. Discussion on wildlife and wildlife habitat is limited to special habitat features, big game, upland game, and threatened and endangered plants and animals. Other wildlife (non-game species, predators, etc.) would not be significantly affected by the actions proposed in this document..

Studies on the habitat requirements of lesser prairie chicken, scaled quail, and pronghorn antelope have been completed for the Roswell District by New Mexico State University. Habitat condition for mule deer and pronghorn antelope was derived from digitized data supplied by the NMDG&F, and from the range inventory conducted by BLM. Appendix E-1 explains procedures for wildlife analysis of existing and alternative levels of habitat and animal numbers.

SPECIAL HABITAT FEATURES

Special habitat features (SHFs) were inventoried in Chaves and Lincoln Counties during 1981 and 1982. Special habitat features are either manmade, such as dirt tanks and wildlife guzzlers, or natural, such as cliffs and sink holes. The SHFs of primary importance in the planning area that would be affected by livestock grazing include approximately 1,400 acres of riparian salt cedar habitat, and 250 acres of riparian cottonwood habitat adjacent to the Pecos River (BLM Roswell IHICs data 1982). These areas are extremely important wildlife habitat areas. They provide forage and cover for big game and small mammals, and food, cover, and nesting strata for birds. The edge effect created by riparian vegetation provides the habitat diversity necessary to support wildlife species diversity. The ecological condition of the identified habitat ranges from fair to good.

BIG GAME

Desert Mule Deer. Approximately 1,800 desert mule deer, of a total population of 25,000, inhabit the public land in the planning area (excluding east Chaves County, Map 2-2). Heaviest concentrations are found in brushy drainages and bottomlands, which include about 20,000 acres of public land. Little-leaf sumac, mesquite, Mexican walnut, and desert willow are among the common shrubs and trees which grow in these bottoms and which provide browse and cover for deer. Digitized data obtained from the NMDG&F indicates that most of the deer habitat is in fair to good condition and in a stable trend. Approximately 5 percent of the habitat is in poor condition, but with a stable trend (NMDG&F estimate).

An estimated 200 mule deer are thinly populated over some 425,263 acres of public land east of the Pecos River (this area was previously analyzed in the East Roswell Grazing EIS, 1979; the discussion on the desert mule deer east of the Pecos River is being presented as background material for the proposed shinnery oak control which will be analyzed in the DPA, Chapter 3). Heaviest concentrations of deer are along escarpments (such as the Caprock), the Pecos River, and in the sandy shinnery oak country below the Caprock. An estimated 75 percent of the habitat is in fair condition (NMDG&F digitized data).

Research conducted by Krysl et al. 1979, in the Palo Duro Canyon of Texas, proved shinnery oak to be the most important food item in desert mule deer diets (comprising approximately 37 percent of the annual diet). Other studies throughout New Mexico and Texas (Stewart 1959, cited by Krysl 1979; Boeker et al. 1972; and Anderson et al. 1965, cited by Krysl 1979) found other oak species to be similarly important in mule deer diets. Boeker et al. 1972, suggested that oak browse was a major yearlong dietary item because of high availability in the habitat. He also found a seasonal shift to generally more nutritious forb species with respect to availibility and deer preference.

Pronghorn Antelope. Pronghorn antelope are also found throughout the planning area. For discussion purposes, the antelope populations will be distinguished as two separate units - those found within the "Antelope Habitat Study Area" (see map 2-3) and those found throughout the remainder of the planning area.

During the 1960 re-adjudication process, 4,489 AUMs were reserved for wildlife use on public land. At existing herd numbers, big game on public land are using 2,604 AUMs, leaving an excess of 1,885 AUMs for other uses.

Pronghorn Habitat - Exclusive of the Study Area

Pronghorn antelope habitat located outside the "Antelope Habitat Study Area" is primarily within grassy rolling uplands. This is predominately a cattle grazing area encompassed by barbed-wire fencing which allows antelope movement between pastures and allotments. According to the NMDG&F information (Digitized Printouts, June 1983), this area is in stable condition, with herd numbers either static or experiencing an upward trend.

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Roswell District Office
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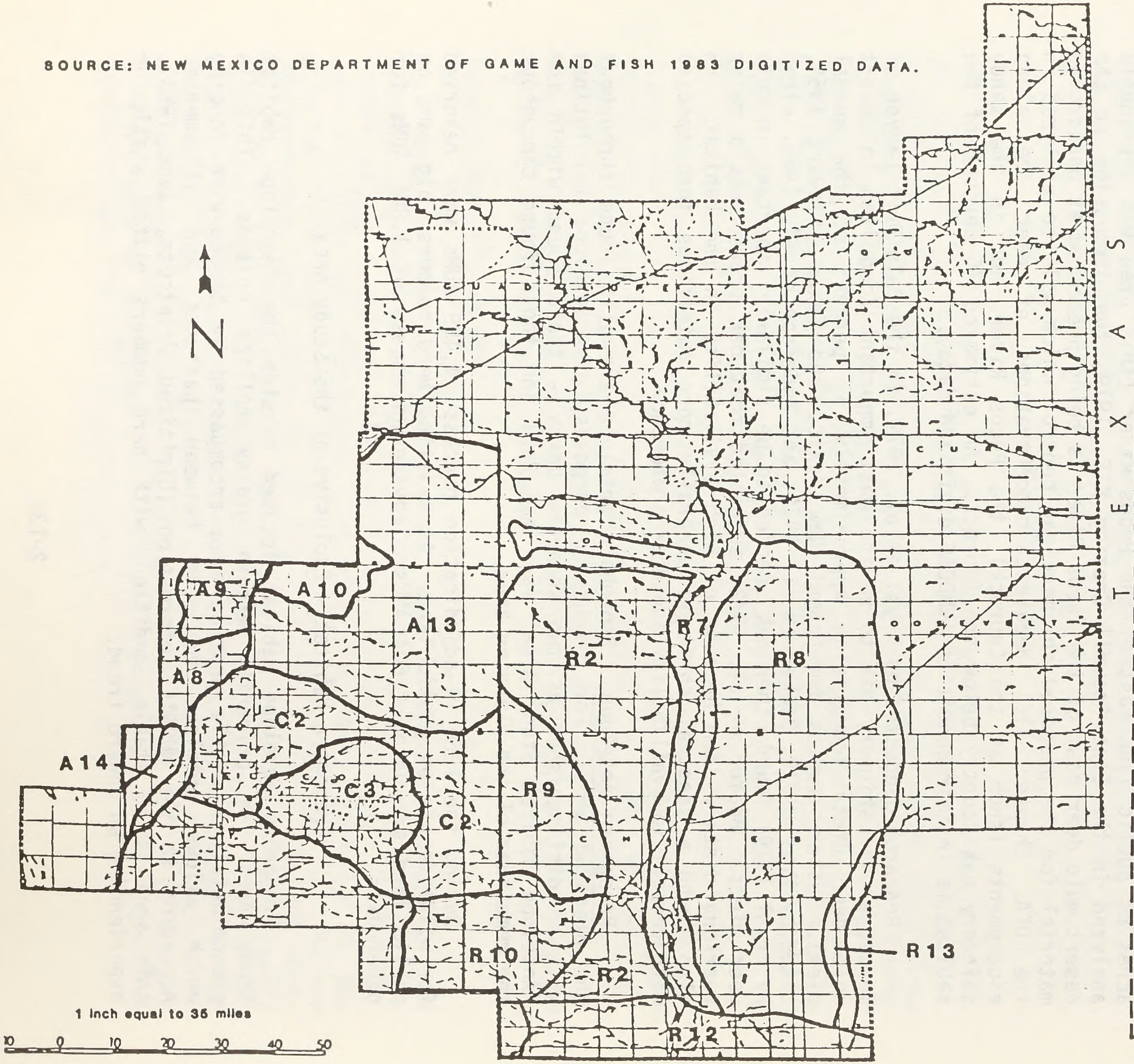
MAP 2-2 DEER POPULATION ESTIMATES

SOURCE: NEW MEXICO DEPARTMENT OF GAME AND FISH 1983 DIGITIZED DATA.



AREA	DEN./SEC	DEER ON PUBLIC LAND
ALBQ. DEER HERD UNIT		
A8	0.25	17
A9	1.00	2
A10	3.50	11
A13	0.35	134
A14	6.00	258
CAPITAN DEER HERD UNIT		
C2	3.00	561
C3	2.50	3
ROSWELL DEER HERD UNIT		
R2	0.08	19
R7	1.00	133
R8	0.08	34
R9	2.00	362
R10	3.00	387
R12	0.50	166
R13	0.50	30

TOTAL PUBLIC DEER:2116

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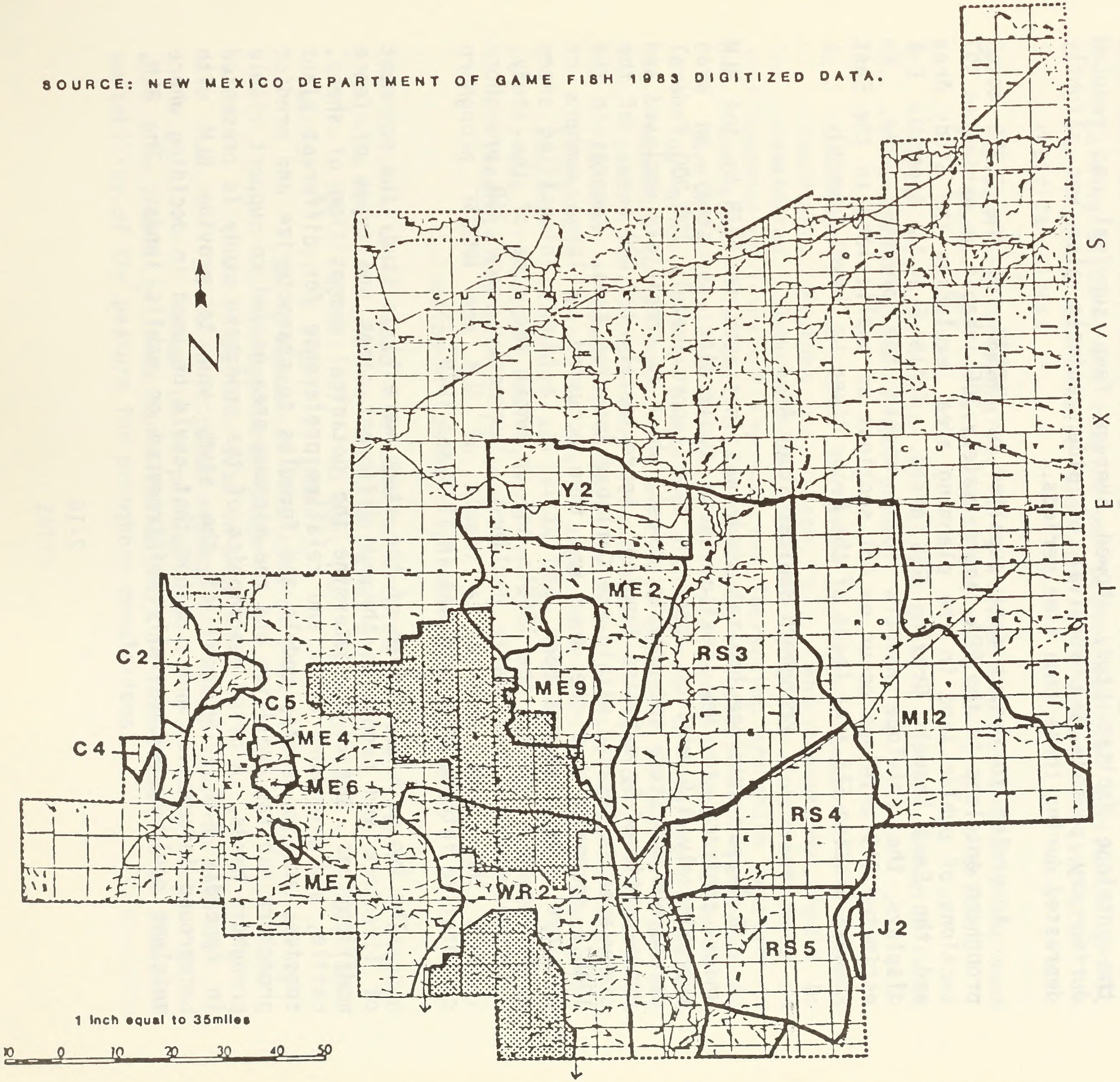
MAP 2-3 ANTELOPE POPULATION ESTIMATES

SOURCE: NEW MEXICO DEPARTMENT OF GAME FISH 1983 DIGITIZED DATA.



ANTELOPE HABITAT STUDY AREA ▨

AREA	DEN./SEC.	ANTELOPE ON PUBLIC LAND
C2	.08	3
C4	.41	26
C5	.43	1
ME2	.23	8
ME4	.76	2
ME6	5.88	41
ME7	2.78	14
ME9	1.02	73
WR2	.31	87
Y2	.32	35
RS3	.05	12
RS4	.22	47
RS5	.84	188
MI2	.58	104
J2	.90	3

TOTAL PUBLIC ANTELOPE:804

Results from the Antelope Habitat Study (Howard 1983) concluded that the diet of pronghorns was dominated by forbs (66-76 percent) throughout all seasons, while cattle diets were dominated by grasses (67-77 percent). Since the diets of pronghorns and cattle are so dissimilar, no apparent problem of competition exists between the two species in the area outside the Study. Plant production and pronghorn trends in general, are tied to variations in the amount and timing of rainfall. Studies have shown that winter survival of antelope closely relates to the amount of rainfall received during the August through October period (Hailey 1979). Heaviest antelope losses can occur in areas where high population densities are reached during a series of favorable rainfall years followed by a dry late-summer/early-fall period. Up to 90 percent of an entire population can be lost in an affected area within a 6-month period because sufficient vegetation was not produced for the animals to recover their body condition after the rigors of the breeding season (Hailey 1979). Conclusions derived from the Antelope Habitat Study showed average fawn survival was reduced during dry periods and survival of older animals also was slightly depressed during these same time periods.

According to census data supplied by NMDG&F, of the 4,358 total pronghorn antelope in the RRA, approximately 385 inhabit an estimated 397 sections of public land in the planning area (excluding the Study Area and the East Roswell Grazing EIS area). Table E-a in Appendix E-1 displays the antelope numbers found within the planning area. An estimated 219 antelope occur on 461 sections of public land in the East Roswell Grazing EIS area (east of the Pecos River in Chaves County).

Pronghorn Habitat Study Area

A 4-year antelope habitat study was initiated in 1978 by the BLM under contract to New Mexico State University to study an area approximately 1.5 million acres in size (approximately 700,000 Federal acres, 800,000 State and private acres), which is completely enclosed and cross-sectioned by net-wire fencing. Approximately 100,000 acres of the study area is located within the Carlsbad Resource Area. Records in the 1940's document that the area was then occupied by large numbers of antelope. The area has been, and still is, a highly intensified sheep producing area. Since the 1940's and up until the time of the study, antelope numbers drastically declined. Currently, some 769 pronghorn inhabit the study area as a result of BLM and NMDG&F pronghorn cooperative introduction programs in 1978 and 1979.

The two main objectives of the study were 1) to study the movement of livestock and pronghorn through different sizes and types of fence modifications, and 2) to determine the botanical composition of sheep, cattle, and pronghorn diets and relative preference for different plant species; and to develop models and formulas to characterize and predict pronghorn habitat qualities and the minimum area needed to support viable pronghorn herds. A brief description of the pronghorn study is presented in Appendix E-2. The goal of the study was to provide BLM with background information and a method that could be used in deciding where antelope could be successfully reintroduced on public lands. The BLM, which is responsible for the habitat, depends upon the NMDG&F for the trapping and transplanting of the pronghorn and the landowner for providing year-round water (approximately 75 percent of the existing water facilities are on private land.) All transplants are cooperative efforts between the BLM, NMDG&F, and landowners where private land is involved.

The following management recommendations were made by New Mexico State University as a result of the four-year study contract.

Fence Structures

1. In pastures with net-wire fencing where adult cattle are the primary livestock, the horizontal grill, or 4-strand barbed wire standard should provide adequate passages for pronghorns.
2. Calving pastures may require use of the modified horizontal grill, the 4-strand barbed-wire standard, or the net-wire variation to restrict calves.
3. The modified horizontal grill is recommended for pastures enclosed with sheep-tight net-wire when adult sheep are to be contained.
4. Lambing pastures require use of the 81.3 cm (32 in) net-wire fence or the modified horizontal grill.
5. Selection of an area to place pronghorn passes is extremely important. Pasture use, shape, size, and topography should be considered. Topographical features play an important role in decreasing livestock exposure and increasing pronghorn exposure to the pass. Placement of passes near ridgetops will generally be more beneficial to pronghorn than placement of the structures in low areas. This placement also serves to decrease livestock exposure to the pass. Passes should generally be placed in pasture corners or bends away from areas frequented by livestock. Placement of passes in corners or fence bends also works to funnel pronghorns into the pass area and thus increase pronghorn exposure. Placement of passes away from water sources, salting areas, livestock trails, and vehicle routes can further reduce livestock exposure to passes.

Selection of Pastures Suitable for Pronghorns

The following model should be used to predict the viability of a stocked pronghorn herd in a pasture fenced with net wire:

$$VI = 1.082 + (0.106)(X1) - (0.006)(X2) - (0.068)(X3) - (0.059)(X4)$$

where: VI is Viability Index
X1 is number of forb species from fall vegetation survey
X2 is ruggedness index
X3 is pasture size in sections
X4 is anticipated average fall sheep stocking rate in animal units per section

The Viability Index can alternatively be interpreted as an index of suitability of the pasture for pronghorn populations.

A decision on whether to stock any pasture with pronghorns will involve trade-offs between the desirability and cost of stocking, and the risk of failure or probability of success of the herd as indicated by the value of the Viability Index for that pasture. Pastures with a Viability Index less than 1.0 should not be stocked with pronghorns. Pastures with a Viability Index greater than 1.5 have a high probability for maintaining successful herds under normal conditions.

Pronghorn stocking usually occurs in early spring; pronghorns should not be stocked in a spring following a dry winter or preceding a predicted dry year. Initial stocking density for pronghorns on selected pastures should be 2 pronghorns/section (130 ha/pronghorn), with a sex ratio of about 3 females/male.

Upon completion of the study, a public meeting was held in Roswell on October 21, 1983. The study authors presented their findings, conclusions, and recommendations to the BLM, NMDG&F, local ranchers, wildlife and environmental groups, and other interested public. The general concensus of those in attendance was acceptance of the study's findings and approval of the BLM's plan for expansion of pronghorn habitat within the study area.

The viability model described within the study will be used as the tool to decide whether or not areas of land would be suitable for reintroduction of antelope. The BLM has initiated inventories and analysis of existing information, i.e., number of fall forb species, calculation of ruggedness index, kind and numbers of livestock within allotments, and pasture size. After allotments have been determined to be suitable for pronghorn introduction based upon evaluation of suitability criteria outlined in the viability index, a Habitat Management Plan (HMP) and cooperative agreement will be developed and implemented through cooperation with NMDG&F and landowners.

Within the HMP, and included in each cooperative agreement, fence modifications will be included where determined necessary. In most situations this will occur in areas where the size of a pasture is the limiting factor for herd viability.

A site-specific HMP will be developed after the required information has been collected to determine where antelope can be successfully introduced and viable herds maintained.

No further discussion of this study area will be presented in this document.

GAME BIRDS

Mourning Dove. Mourning doves are found throughout the planning area. Populations peak during June and July, decline during August and early September, and are at the lowest point during the winter (Davis et al. 1971). Annual migration through the area during September and October temporarily swells local populations. Local concentrations in the fall are found in grain fields located on private land and around stock tanks.

Of the game birds, the mourning dove is the least affected by drought, reduction of ground cover by livestock, or other uses of the land (Ligon 1961). They nest readily in all habitats except creosote and shinnery oak areas. Nesting strata include bushes and trees, and if these are not available, they nest on the ground. Important dove nesting habitat in the RRA is found in areas of concentrated salt cedar along the Pecos River (Hildebrant and Omart 1982).

Weed seeds and grain crops meet the feeding needs of mourning doves and, if these are not found in one area, they move on to better feeding grounds. In arid areas, mourning doves commonly feed along road shoulders where runoff from the pavement results in growth of seed-producing forbs (Ligon 1961). Studies show there is no critical overlap in diets between scaled quail and mourning doves, and ranges may be shared without competition (Griffing and Danis 1976). Mourning doves are opportunistic in their water requirements and will utilize any available source of water even if it requires flying long distances to obtain it.

Scaled Quail. Scaled quail inhabit the transition zone between grassland and shrubland habitats (Brown 1978) where annual precipitation averages only 8 to 16 inches. Numbers are highest in mesquite grasslands, followed by mixed desert shrublands and shinnery oak lands. Important habitat in the planning area is found primarily in canyons and draws. Concentrations of scaled quail are local and may be found around ranch buildings, corrals, and livestock waters.

Areas heavily used by livestock are characterized by invasions of mesquite and snakeweed. Heavily used livestock range is favored by scaled quail since mesquite pods and snakeweed seeds are a major portion of their winter diets (Davis, et al. 1975).

The most severe factor limiting scaled quail is the weather. They are so sensitive to moisture, or the lack of it, that changes in precipitation can very seriously curtail breeding season success. It is unlikely that quail reproductive success depends directly on seasonal precipitation per se, but rather on some other factor or factors which are controlled by seasonal precipitation (Campbell 1971).

An important niche in the habitat of scaled quail is their roosting site. Quail roost on the ground in concealing vegetation averaging 13 to 34 inches in height. Shrubs and grasses provide most of the concealing vegetation. Present vegetation in southeastern New Mexico provides an abundance of roosting sites and potential roosting sites for scaled quail. Following brush control, replacement of shrubs by grasses should not greatly reduce availability of roosting habitat. Quail may not roost in areas where cover exceeds 50 percent, however, with continued cattle grazing any given pasture will probably remain open enough for quail roosting (Davis 1974).

Lesser Prairie Chickens. Lesser prairie chickens in the planning area are currently being managed on 561,300 acres of Federal, State, and private land under the Caprock Habitat Management Plan. Lesser prairie chickens inhabit the sandy shinnery oak/grassland habitats of the eastern part of the planning area. Habitat is generally in poor condition for lesser prairie chickens due to increased shinnery oak densities and the subsequent decrease in mid-grass densities. Research conducted by New Mexico State University under BLM contract (Davis et al. 1979) showed that lesser prairie chickens preferred habitat containing a composition of 25 percent sand bluestem and 30 percent shinnery oak. Most existing (and also less preferred) habitat contains approximately 5 percent sand bluestem and 30 percent shinnery oak. Lesser prairie chicken numbers in the planning area vary according to precipitation and habitat quality. BLM monitoring studies over a 13-year period have shown lek sizes to range from 7.7 males/lek to 14.6 males/lek (in 1983), with a mean of 10.0 males/lek. Although numbers increased in the 1983 census, the increases are probably due to external factors over which the BLM has no control, particularly climatic conditions. Total chicken densities (males and females) in the BLM monitoring area ranged from 2.6 chickens/section to 12.4 chickens in different habitats during the 1983 census. To put these figures in perspective, however, a similar study area in the sand-shinnery oak country of Texas reports prairie chicken densities of 21 chickens/section (personal communication, Richard De Arment, Technical Guidance Biologist, Texas Parks and Wildlife Dept.).

The decision of the East Roswell Grazing EIS, and East Chaves MFP III was to forego control of shinnery oak due to anticipated adverse impacts to watershed and wildlife resources. Based on recent research (Biondini and Pettit 1978; Pettit 1979; Davis et al. 1979; Ahlborn 1980; Doerr 1980; Jones and Pettit 1980; Biondini and Pettit 1980) indicating that shinnery oak control can be beneficial to wildlife, experimental control of shinnery oak was initiated in East Chaves County in 1981 (see Appendix E-4 for decision statement). To date, approximately 12,000 acres of shinnery have been treated using different rates of herbicide application; approximately 15,000 additional acres are planned for FY 1984.

THREATENED AND ENDANGERED PLANTS AND ANIMALS

In compliance with the Endangered Species Act of 1973 and the 1979 and 1982 amendments thereof, the RRA officially requested lists of endangered and threatened plant and animal species from the U.S. Fish and Wildlife Service, New Mexico Department of Game and Fish, and the New Mexico Natural Heritage Program (Appendix E-3). The species list in Appendix E-3 was provided by the agencies for inclusion into the analyses of this document. Of these, 7 species (Table 2-6) are potentially impacted by grazing or grazing management actions. Those species not listed in Table 2-6 will not be impacted by actions prescribed in this document.

Both Baird's sparrow and McCown's longspur are birds declining in number due to loss of near-climax range condition. Grazing, drought, and the conversion of grassland to agricultural uses (Hubbard et al. 1979) are reasons for habitat loss.

TABLE 2-6
T/E SPECIES POTENTIALLY IMPACTED BY GRAZING OR GRAZING MANAGEMENT

Species	Limiting Factors	Source
State Animals		
Baird's sparrow	Grazing intensity	Hubbard et al. 1979
McCown's longspur	Grazing intensity	Hubbard et al. 1979
Sanddune sagebrush lizard	Brush Control	Hubbard et al. 1979
State Plants		
Guadalupe milkvetch	Grazing intensity; Brush Control	NMNHP 1983
Davis cholla	Brush Control	NMNHP 1983
Zephyr lilies	Brush Control	NMNHP 1983

Source: USFWS, NMDG&F, NMNHP, RRA EIS files.

The sanddune sagebrush lizard is an inhabitant of the sandy shinnery oak habitats east of the Pecos River. Naturally occurring dune stabilization and low lizard densities (3.0 to 4.8/ac) prompted listing of this species in the State Endangered Group II. Degenhardt and Sena (1976) and Egbert (1979) described four habitat types within the shinnery community: sand flats, oak sand hummocks, dune interface, and open dunes. Both oak/sand hummocks and dune interface habitats are considered preferred habitat, and are usually found within the readily identifiable SCS SD-3 sandhills range site.

Guadalupe milkvetch is found on stony limestone hills and plains. It is an uncommon cool season perennial. Brush control and grazing are considered possible threats to this plant's continued existence in control areas.

Davis cholla is a relatively common inhabitant of limestone canyon and plains habitats that may or may not be infested with mesquite. Chemical or mechanical control in these areas could adversely affect the Davis cholla.

Zephyr lilies are inhabitants of alkaline soils on plains habitats in the planning area. Brush control could adversely affect this species.

AIR QUALITY

In general, air quality in the area is good. Summer winds flow from the southeast, becoming southwesterly in the winter and early spring. Winds average 10 miles per hour (mph) in the fall and 16 mph in the spring. Peak velocities reach 50 mph. This combination gives southeastern New Mexico some of the best conditions in the nation for rapid dispersal of pollutants. Wind action on exposed or disturbed soils is the primary source of air pollution in this area. These soil particles create dust storms of various magnitudes, depending on wind velocity.

CULTURAL RESOURCES

Evidence exists that the Roswell Resource Area has been continuously occupied for the past 12,000 years. The major periods of occupation are Paleo Indian 12,000-7,000 Before Present (BP), Archaic 7,000-1,000 BP, Ceramic 1,000-400 BP, Historic Indian 400-100 BP, and Historic Anglo 100 BP to present. The archaeological data base for the Roswell Resource Area is very limited.

A more detailed cultural history for this area, including site types and summaries of major survey and excavation projects, can be found in the Cultural Resource Overview for the Roswell District by Camille and Allen, Prehistoric New Mexico by Stuart and Gauthier, the Cultural Resource Technical Notes (Roswell District Office files), and the East Chaves planning documents.

Since the publication of the above documents, several large area surveys, such as the Two Rivers Dam survey by the Corps of Engineers, and the Haystack Mountain area by Eastern New Mexico University, have been undertaken. The majority of the surveys within the area continue to be small surveys for well pads or linear rights-of-way. Several large rights-of-way such as Mapco, Shell CO_2, and Highway 70 have been surveyed within the RRA.

A Class II Sample Survey of a portion of the Abo Gas Field north of Roswell was begun in September 1982. This Class II project requires the development of models which predict site locations within this area and field testing of the models by means of a sample survey. The purpose of this Class II project is to provide estimates of site population by cultural affiliation, settlement pattern models, areas of high cultural sensitivity, areas of low site density, and a basis for significance assessment. Work under this project is expected to be completed in FY 84.

The following site information is based on existing information. The East Chaves planning system (Unit Resource Analysis, MFP) addressed the cultural resources in Chaves County east of the Pecos River. This discussion, however, is limited to cultural resources located on the better blocked public lands in West Chaves, Lincoln and DeBaca Counties. Approximately 236 cultural resource sites are located within this area. Of these, 224 are prehistoric sites and 12 are historic. Archaeologists working in the area have attempted to assign a date to only 45 of the prehistoric sites. The most common designation is the broad category of Jornada Mogollan (AD 95-1,400).

Prehistoric site types common to the area include caves and/or shelters, lithic scatters, lithic and ceramic scatters, hearths and burned rock scatters. Seventy-five percent of the sites from this area fall into the lithic scatter category while 16 percent of the sites are lithic and ceramic scatters. Twenty-five percent of the prehistoric sites contain evidence of cooking or heating activities in the form of hearths or burned rock.

A brief analysis of topographic information indicates that 96 (43 percent) of the prehistoric sites are located along either drainages or ephemeral lakes. Thirteen percent of the sites are located in either sandy soil or sand dunes.

Insufficient information is available to provide density estimates, settlement patterns, population estimates, or site sensitivity. Consultation with the SHPO is documented in Appendix F.

RECREATION

Recreational opportunities in the RRA include hunting, camping, and dispersed recreation including picnicking, hiking, sightseeing, caving, and a limited amount of ORV use. The Ft. Stanton Agricultural Experiment Station is the site of the planning area's only developed picnic ground. Located near Bonito Creek, this site has many historical features to visit, including a petroglyph site and Fort Stanton Cave (entrance by permit). Picnic tables, fire rings, and sanitary facilities are available for public use.

Two Wilderness Study Areas (WSAs) are currently under consideration for inclusion into the National Wilderness Preservation System. The two WSAs have been evaluated in the Roswell District Draft Environmental Assessment as part of a statewide BLM wilderness study process. These two areas, the Carrizozo Lava Flow (10,000 ac) and Little Black Peak (15,000 ac), are recent (1,000-2,000 years) lava flows located just west of Carrizozo. Visitor use of the two areas consists primarily of sightseers, researchers, birdwatchers, cave explorers, naturalists, and hunters.

While hunting is perhaps the most popular seasonal sport of the planning area, the limestone landscape of the west side contains another resource attractive to sports enthusiasts. The limestone terrain contains numerous sinkholes, disappearing streams, caves, and an underground drainage system. The geologic term for this type of terrain is "karst". In karst areas, erosional processes which would normally act at the land surface are concentrated below ground in the labyrinths of limestone. In particular, the debris produced by weathering cannot be transported away in areas without surface drainages (Ford 1976). Essentially, this means that in karst areas, caves are gutters which carry away wastes produced by surface degradation.

In areas where range condition is deteriorating, various components of the hydrologic/geologic environment such as surface erosion, infiltration, evaporation and siltation are impacted (Bell, H.M. 1973). Changes in these components can affect the natural processes which have created and preserved the unique cave resources in the area.

Changes to cave resources can occur when surface runoff is altered. These changes primarily affect the amount of water and surface material which enters the caves. Water infiltration into caves and cave sedimentation are directly related. The consequence of reduced infiltration rates is increased runoff and sedimentation. Reduced infiltration into the ground and caves not only effect the cave's climate, but also the growth of cave formations. An increase in sedimentation rates can result in caves being filled in or entrances being closed off.

Hunting for big game, waterfowl, and upland game is estimated to provide 267,122 hours of recreation use per year. The most important game species include mule deer, pronghorn antelope, barbary sheep, quail, mourning doves, pheasants, ducks, geese, and sandhill cranes. Visitor hours used in hunting for mule deer, pronghorn antelope, prairie chickens, and the visitor hours used in other hunting and dispersed recreation are shown in Table 2-7.

TABLE 2-7
RECREATION VISITATION/EXISTING SITUATION

	Visitor Hours
Hunting:	
Deer	
West a/	52,536
East b/	8,973
Pronghorn Antelope	
West	2,134
East	541
Prairie Chickens	
East	86
Dispersed Recreation	343,700

Source: RRA Inventory Files
a/ Exclusive of Chaves County east of the Pecos River
b/ Chaves County east of the Pecos River

It is estimated that the Roswell Resource Area contains over 200 caves. Twelve of the caves have been intensively inventoried and nine have had gates or fences installed. Three of the inventoried caves are quite unique and have achieved both national and international recognition due to their scientific or recreational values. Two BLM-managed caves, Fort Stanton Cave and Torgac Cave, have been designated and registered as National Natural Landmarks.

Data from cave entrance permits indicates recreational use of caves is increasing, although visitor use fluctuates from year to year. Use records or valid estimates of the number of visits are not available for those caves which are not subject to permit requirements.

VISUAL RESOURCES

Landscape Character. The landscape character of the planning area is determined by vegetational cover, manmade alterations, and topographic relief. The area generally increases in altitude progressing from the Pecos River in the east to the highest area on Fort Stanton in the Sacramento Mountains in the west. Elevation begins to drop on the west side of the Sacramentoes.

In general, the landscape of this area can be divided into four units: the Pecos flood plain, Pecos Valley, Pinyon-juniper foothills, and the Carrizozo lava flow. The Pecos flood plains are located along the eastern boundary of the planning area. The landscape of the flood plain is dominated by riparian vegetation and flood water modifications of the local terrain. Dense stands of saltcedar and a few cottonwood groves can be found in the low areas and on flood terraces. Some agricultural use is taking place in the flood plain area in the southern half of the planning area.

The majority of the area under study is located above the Pecos river flood plain in the rolling hills and mesas of the Pecos valley. This area is generally composed of limestone and gypsum hills with scattered sinkholes and land features typical of karst regions. Vegetation here consists mainly of short grasses, broomweed, occasional stands of mesquite, and other plants common to the region.

Perhaps the most scenic landscape in the planning area is the foothill region of the Capitan and Sacramento Mountains. This area contains a variety of vegetation dominated by pinyon and juniper trees. Fort Stanton is the highest point in the planning area at 7,031 feet. This region is composed of rolling foothills, valleys, and forested mesas.

The final landscape area to be discussed is located on the western boundary of the unit. A few miles west of Carrizozo is a recent (1,000-2,000 years old) lava flow cut by Highway 380. The flow is over 44 miles long from north to south, however, it is only about 2 to 4 miles wide. The surface of the flow is extremely rough and broken due to the presence of fractures, collapsed lava tubes and pressure ridges. The flow supports a remarkably diverse vegetation community, composed primarily of plants found in the Upper Sonoran Life Zone. The Valley of the Fires State Park is located along the flow adjacent to the highway and provides access to the lava flow.

Cultural modifications which affect landscape character are scattered throughout the Resource Area and include fences, stock watering facilities, ranch buildings, oil and gas exploration and production facilities, highways, roads, pipelines, powerlines, railroads, and vegetation treatments. Depending on the attitude of the viewer, all these modifications may or may not be seen as visual intrusions. Most facilities associated with grazing are sufficiently scattered so as to reduce any significant impact to the scenic quality. The facilities, windmills in particular, are considered by some people to be symbols of the western lifestyle and to add a certain charm. In intensively developed oil and gas fields, the production facilities give a busy appearance to the landscape and dominate the scene.

The Bureau's Visual Resource Management (VRM) system provides for the protection of significant visual resources on public lands which are affected by multiple uses made of that land. The policy of the VRM program is to emphasize the project design phase to minimize adverse visual impacts and maximize visual enhancement in highly scenic landscapes and significant high-impact projects. For more detail on the VRM system, see Appendix H.

SOCIOECONOMIC CONDITIONS

Social values of ranch operators and their families have not changed appreciably since the socioeconomic study was conducted for the East Roswell Grazing EIS (Harbridge House, Inc. 1979). This study, on file at the Roswell District Office, documents the attitudes and perceptions of the rancher's lifestyle - their independence, self reliance, and inherent distrust of Government regulation and control. For many years, the dominance of ranching has contributed in a large degree to local social characteristics. Historically, members of the ranching community have been well-known and regarded both socially and politically. Recently, increased demands for access to and use of the public resources have been perceived by some as a threat to the traditional ranching lifestyle.

Demography. In 1980, the population of the planning area was estimated to be 137,341 (10.5 percent of the total state population). The area is sparsely populated - average population density is 7.6 persons/sq. mi. - with the majority of the population concentrated in the major trade centers. Sixty-eight percent of the population was in Chaves and Curry Counties.

Between 1960 and 1980, all of the counties experienced changes in population. Populations in Chaves, Curry, and Lincoln counties increased while the populations in DeBaca, Guadalupe, Quay, and Roosevelt Counties decreased (see Table 2-8).

TABLE 2-8
POPULATION OF THE ROSWELL RESOURCE AREA
1960-1980

Counties	Population by Census Years			Percent Change 1970-1980	Population Density 1980
	1980	1970	1960		
Chaves	51,103	43,335	57,649	17.9	8.4
Curry	42,019	39,517	32,691	6.3	29.8
DeBaca	2,454	2,547	2,991	-3.7	1.1
Guadalupe	4,496	4,969	5,610	-9.5	1.5
Lincoln	10,997	7,560	7,744	45.5	2.3
Quay	10,577	10,903	12,279	-3.0	3.7
Roosevelt	15,696	16,479	16,198	-4.8	6.4
RRA	137,341	125,310	135,162	9.6	7.6
State	1,302,894	1,016,000	951,023	28.1	10.5

Source: U.S. Department of Commerce, Bureau of Census, 1980.

Income. Estimated personal income in the 7 county area (Table 2-9) totaled $319.7 million. Of this total, approximately $10.9 million is attributable to the livestock industry. Table 2-9 shows that, of the livestock industry income, $591,000 is generated by the BLM range livestock industry and approximately $10.3 million is generated by other livestock industry. The livestock industry, BLM livestock industry, plus the other livestock industry, comprises a very small part of the total economy. Personal income represents approximately 3.5 percent of the total income and employment represents approximately 5.0 percent of the total employment. Fluctuations in this industry caused by changes of market conditions, or changes in herd sizes, while creating adverse and sometimes significant impacts to the ranchers, does not cause a measurable change in the employment patterns or in the in-or-out migration of people of the region. The average per capita income ($7,496) was lower than the State average ($7,878), Southwest Region ($8,844), or the United States ($9,511) (See Table 2-10).

TABLE 2-9
ESTIMATED PERSONAL INCOME AND EMPLOYMENT FOR THE
ROSWELL RESOURCE AREA, 1982

	Industry Sector	Income	Employment
1.	BLM Range Livestock	$ 591,000	195
2.	Other Livestock	10,320,000	1,534
3.	Other Agriculture	7,343,000	1,149
4.	Agriculture, Forestry, Fisheries, Service	1,698,000	276
5.	Metal Mining	533,100	44
6.	Petroleum & Natural Gas Well Development	795,900	41
7.	Petroleum & Natural Gas Well Maintenance	697,300	31
8.	Petroleum & Natural Gas Extraction	2,576,000	179
9.	Other Mining	465,300	33
10.	Construction	48,950,000	2,472
11.	Prepared Feeds	10,160,000	297
12.	Other Food Products	15,620,000	1,402
13.	Apparel, Purchased Material	10,070,000	993
14.	Other Apparel	47,170	6
15.	Wood Products	219,600	24
16.	Furniture	34,450	3
17.	Paper Products	100,600	7
18.	Printing and Publishing	3,004,000	258
19.	Chemicals	481,300	34
20.	Rubber and Plastic Products	406,000	44
21.	Leather Products	56,210	6
22.	Stone, Clay and Glass	2,097,000	151
23.	Fabricated Metals	845,100	63
24.	Machinery, Except Electrical	593,300	56
25.	Electrical Equipment	1,699,000	124
26.	Motor Vehicles	9,572,000	635
27.	Other Transportation Equipment	44,880	3
28.	Miscellaneous Manufacturing	747,800	82
29.	Railroads	9,329,000	815
30.	Other Transportation	10,910,000	875
31.	Communication	7,867,000	539
32.	Utilities	6,367,000	517
33.	Wholesale Trade	20,720,000	1,816
34.	Retail Trade	40,590,000	6,274
35.	Finance, Insurance-Real Estate	24,690,000	2,036

TABLE 2-9 continued

36.	Hotels and Lodging Places	4,957,000	1,029
37.	Personal Services	5,732,000	625
38.	Business Services	4,672,000	524
39.	Professional Services	7,272,000	488
40.	Eating and Drinking Places	11,070,000	2,974
41.	Auto Repair and Service	5,550,000	327
42.	Amusement and Recreation Services	5,816,000	621
43.	Other Services	24,000,000	2,403
44.	BLM Range Improvements	405,500	29
		$319,715,510	33,034

Source: BLM Roswell District Input/Output (I/O) files

TABLE 2-10
PER CAPITA PERSONAL INCOME IN THE ROSWELL RESOURCE AREA, STATE, SOUTHWEST REGION, AND THE UNITED STATES, 1980.

Counties	Income
Chaves	$ 8,007
Curry	8,050
DeBaca	8,019
Guadalupe	5,691
Lincoln	7,653
Quay	7,462
Roosevelt	7,591
RRA	7,496
Southwest Region	8,844
New Mexico	7,878
United States	9,511

Source: United States Department of Commerce, Bureau of Economic Analysis (BEA), 1982.

Employment. Employment was estimated at 33,034 individuals of which 5.23 percent was in the livestock industry (Table 2-9). In January 1983, the unemployment rate for the 7 counties in the RRA averaged 7.5 percent compared to 10.9 percent for the State (Table 2-11).

TABLE 2-11

PERCENT UNEMPLOYMENT FOR THE ROSWELL RESOURCE AREA, 1983.

Counties	Percent Unemployment
Chaves	6.7
Curry	9.7
DeBaca	6.5
Guadalupe	6.5
Lincoln	4.9
Quay	12.0
Roosevelt	6.5
RRA Average	7.5
State Average	10.9

Source: New Mexico Employment Security Commission, New Mexico Labor Market Review, 1983.

Development of energy and recreational resources has caused an influx of new industries, services, and population into Chaves, Curry, and Lincoln Counties. The recent discovery of natural gas just north of Roswell has increased employment opportunities and income, as well as creating stress on the infrastructure of Roswell from increased population. The increased population in Curry County has occurred due to the development of energy resources. Winter sports and horse racing has attracted many permanent and seasonal residents to Ruidoso in Lincoln County, and is largely responsible for the increased growth.

As the energy resources were developed and more people were moving into Ruidoso, the emphasis within the economy shifted. Prior to these occurences, the economy was largely based on agribusiness, but presently it has shifted to an energy or recreation base.

Characteristics of Ranching Population. The planning area contains 284 allotments, which include 127 section 3 permits and 170 section 15 leases. To determine the economic characteristics of ranching, only those allotments containing section 3 permits and those containing a combination of section 3 permits and section 15 leases were considered. Those allotments are used by 76 ranchers, 36 sheep/cow-calf operations and 40 cow-calf operations. These operations were grouped into the following ranch size categories: small commerical cow-calf category 0-199 animal units (AU); medium commercial cow-calf category 200-499 AUs; large commercial cow-calf category 500+ AUs; medium commerical sheep/cow-calf category 200-499 AUs and large commercial sheep/cow-calf category 500+ AUs (one cow AU is equivalent to 5 sheep). The grazing allotments contain public lands in varying amounts. The amount of public lands have been averaged by ranch size category as follows: 46.7 percent for small cow-calf; 42.0 percent for the medium cow-calf; 41.2 percent for the large cow-calf; 58.0 percent for the medium sheep/cow-calf; and 54.4 percent for the large sheep/cow-calf.

Ranch size category budgets indicate that the small cow-calf operation and the medium sheep operations derive a negative dollar return when all costs are considered. A ranch operation with 275-325 AUs is considered to be an economic unit capable of sustaining a family without the head of household having to seek off-ranch employment. See Appendices I-1 through I-20 for individual ranch size budgets.

The use of public lands is authorized by grazing permits based on preference. The permit becomes an integral part of ranch resources and an important financial asset. In 1982, the commercial value for the BLM permit in the RRA, averaged approximately $1,200 per animal unit (AU) with total estimated worth of $38.9 million . Despite poor financial returns from ranching (Table 2-12), ranchers and members of their families choose to continue their ranching lifestyles.

In 1982, the BLM range livestock industry had an estimated $6.1 million in sales (Table 2-12). The total net cash income derived from these sales was estimated to be over $2.8 million. When allowance is made for depreciation from total sales, returns to operator labor, management and capital is reduced to a total net income of minus $1.5 million.

Recreational Values. In the planning area, visitor hours of general recreation (sight seeing, picnicking, hiking, etd.) and the visitor hours generated from hunting on public land add approximately $800,000 to the regional economy (see Table 2-13).

TABLE 2-12

ESTIMATED COSTS AND RETURNS FOR ALL RANCH OPERATIONS IN ROSWELL RESOURCE AREA, 1982

	Cow-Calf Operations			Sheep/Cow-Calf Operations		
Budget Items	Small Commercial	Medium Commercial	Large Commercial	Medium Commercial	Large Commercial	TOTAL
No. of Operators	17	16	6	19	18	76
Gross Income	206,431	809,744	809,814	1,136,428	3,069,558	6,031,975
Total Cash Cost	170,646	622,928	529,632	689,244	1,250,838	3,263,288
Returns Above Cash Costs	35,785	186,816	280,182	447,184	1,818,720	2,768,687
Depreciation	-72,067	-162,736	-211,578	-241,870	-625,752	-1,314,543
Returns to Operator Labor, Management and Capital	-36,822	24,080	68,604	205,314	1,192,968	1,454,144

Source: BLM Roswell District files.

TABLE 2-13
RECREATIONAL VALUES ON PUBLIC LAND

Activity	Value
Hunting:	
Deer	
West a/	$373,531
East b/	63,798
Pronghorn Antelope	
West	10,203
East	4,614
Lesser Prairie Chicken	
East	285
Dispersed Recreation	$330,193

Source: RRA Wildlife Files, Sage Ram

a/ Exclusive of Chaves County east of the Pecos River

b/ Chaves County east of the Pecos River

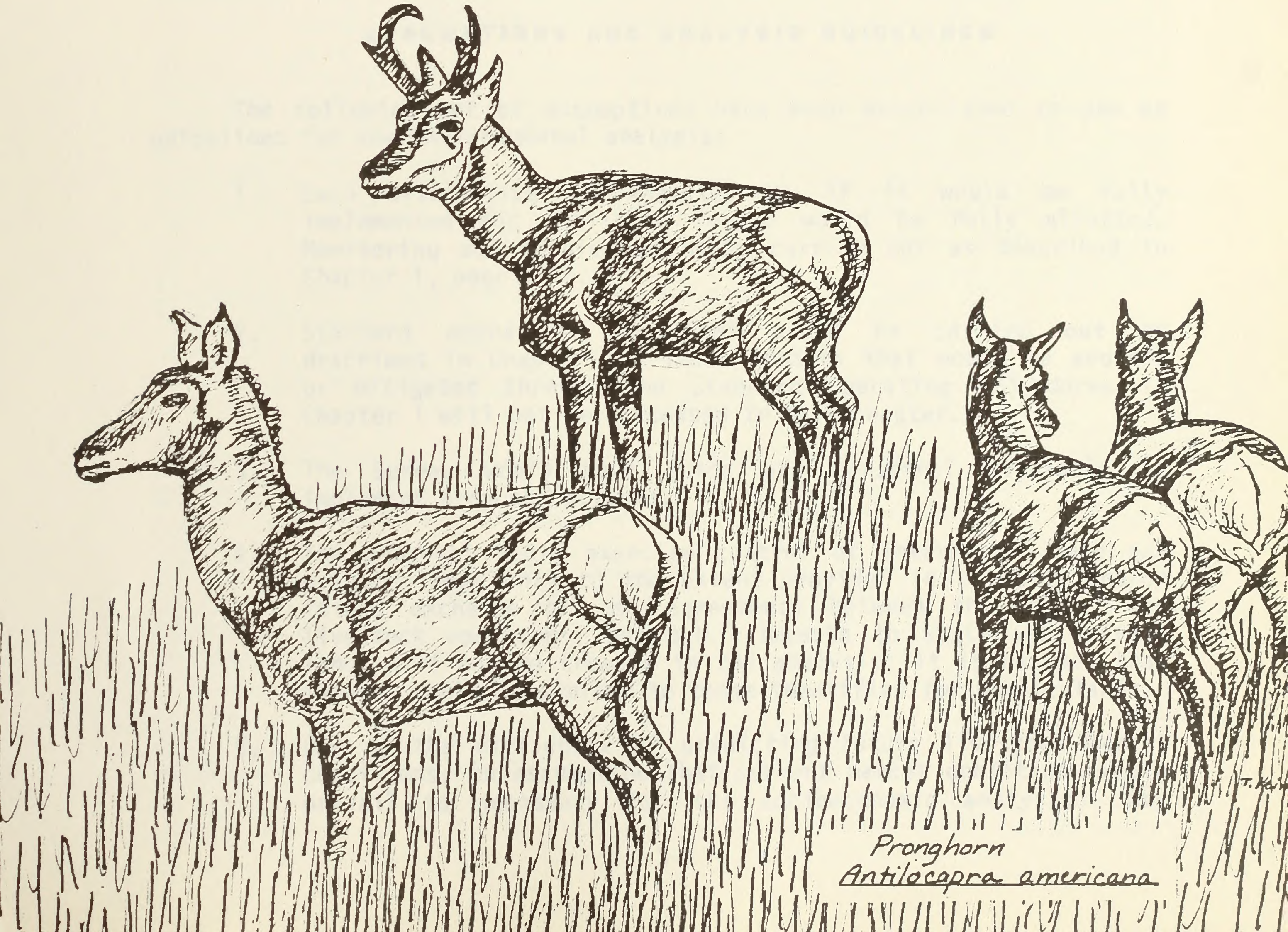
CHAPTER 3

ENVIRONMENTAL CONSEQUENCES

HOW TO READ CHAPTER 3

Chapter 3 describes the effects of implementing any one of the alternatives on the physical biological, social, and economic factors which were described in Chapter 2. Each alternative, with the resource components affected by the alternative's proposed actions, is discussed as an individual unit. Descriptions of the environmental effects which would occur under each alternative begin on the following pages:

	page no.
ASSUMPTIONS AND ANALYSIS GUIDLINES	3-1
PROPOSED ACTION (PA)	3-3
DISTRICT PREFERRED ALTERNATIVE (DPA)	3-9
INDUSTRY PREFERRED ALTERNATIVE (IPA)	3-29
ELIMINATION OF LIVESTOCK GRAZING (ELG)	3-39
MAXIMIZATION OF FORAGE FOR LIVESTOCK (MAX)	3-46
DECREASED LIVESTOCK GRAZING (DLG)	3-58



Pronghorn
Antilocapra americana

CHAPTER 3

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter provides the analysis of projected impacts which would result from implementation of any one of the six alternatives. Alternatives are discussed individually with the resource components organized in the same order as they appeared in Chapter 2. The environmental analysis deals with the major potential impacts and does not cover all the intricacies of the total ecosystem. The interdisciplinary team did not identify any changes that would occur to climate, geology, minerals, paleontology, topography, or urban land use. No further discussion of these resource components appears in this EIS.

Environmental consequences may be of a short-term or long-term nature. Short term or initial impacts are those which would occur within 5 years of implementation of a proposed action. Long-term impacts would occur within 5 to 25 years (approximately to the year 2010) or beyond. Standard operating procedures and mitigating measures described in Chapter 1 would be implemented, therefore, adverse impacts described in this chapter are considered unavoidable. Where appropriate, short-term/long-term relationships will be discussed. No irretrievable or irreversible commitments of resources were identified.

ASSUMPTIONS AND ANALYSIS GUIDELINES

The following set of assumptions have been established to use as guidelines for the environmental analysis:

1. Each alternative is analyzed as if it would be fully implemented and available forage would be fully allotted. Monitoring and studies would be carried out as described in Chapter 1, page 1-16.

2. Standard operating procedures would be carried out as described in Chapter 1. Those impacts that would be avoided or mitigated through the Standard Operating Procedures in Chapter 1 will not be discussed in this chapter.

3. The Bureau would have funds and personnel available to implement proposed actions.

4. The proposal would exercise control of intermixed State and private lands only to the extent provided in existing and/or future exchange of use agreements between the State, the livestock operators, and BLM. Impacts to State and private lands will not be treated in the analysis; it is assumed that impacts would be similar to those identified for public lands.

5. Due to the difficulty of predicting future livestock market conditions, an assumption that current market conditions would prevail is necessary for the socioeconomic analysis. Any

future changes in livestock market conditions would be a result of variables outside the proposed actions discussed in this statement.

6. Assessment of impacts is based on expectations of near-normal annual precipitation. Severe climatic variations could drastically alter projected vegetation responses.

7. For analysis purposes, it is assumed that the permittees or lessees would use all AUMs allotted to them and, if necessary, purchase additional livestock to use any increase in BLM permits or leases.

8. Livestock operators would have up to 5 years to adjust their ranching operations to coincide with any final adjustments of livestock use. Final levels of grazing use would be established based on utilization, actual use, condition, trend, production and climatological data.

9. Big game numbers would be managed by the New Mexico Department of Game and Fish to meet the population level that could be supported by the available forage in each alternative. It is assumed that big game populations would increase or decrease to that level.

10. Baseline data for vegetation condition, trend, and production is the most reliable data currently available.

11. CMPs would be written and fully implemented, and an EA covering each CMP would be prepared. The plans would be monitored and evaluated following implementation so that periodic adjustments, if necessary, could be made on those plans not meeting or exceeding multiple use objectives. Adjustments would be based on utilization studies, actual use data, precipitation, trend, and condition.

12. Local impacts are those which are restricted to the immediate vicinity of the action being discussed, although the actual distance may vary according to the resource being discussed. Unless otherwise stated, all other impacts are assumed to affect the entire EIS area.

13. Vegetation trends would remain relatively unchanged on areas where no grazing programs would be implemented. Operators would continue their preferred management prerogatives.

14. Without brush control programs, grasses which are present in areas of heavy infestations of brush (e.g.: mesquite, creosote, cholla, and shinnery oak) would not show a significant improvement in density under either grazing treatments proposed or the total removal of livestock.

15. Onsite analysis of areas proposed for inclusion in projected brush control treatments would be made to avoid highly

desirable wildlife habitat and cultural resources which would be susceptible to the treatments being considered.

16. The ecological condition and trend of the rangeland would be an indicator of condition and trends in the associated wildlife habitat and watershed areas.

PROPOSED ACTION (PA)

Under the PA, no major changes from existing management direction would occur. No adjustments in stocking rates or current grazing practices are proposed. Authorized grazing would continue at the 5-year-average licensed use level of 228,656 AUMs. While this alternative does not preclude the development of rangeland improvements, extensive improvements and vegetation treatments (not proposed at this time) would be funded primarily in areas where existing plans have been approved (AMPs, Fort Stanton, East Chaves County). This alternative would create the least amount of change to current ranch operations.

IMPACTS OF THE PA ON

VEGETATION

Without treatment, undesirable brush species would increase in areas already invaded and would compete for available moisture with more desirable forage species. Since no new grazing programs would be designed, uneven utilization of forage would continue, with areas closest to water being heavily used and areas farther from water being under utilized. Forage plants in some areas would not have an opportunity to regain vigor, thus forage production in those areas would not increase. Areas currently being managed under improved principles of range management are expected to remain in satisfactory or better condition. Increases in vegetation production and percent cover on good condition rangeland would be offset by losses in production and cover from deteriorated areas. Production and percent cover are expected to remain at existing levels when increases and decreases are averaged over each range category (Table 3-1).

TABLE 3-1
(PA) AVERAGE PRODUCTION AND PERCENT COVER BY RANGE CATEGORY

Range Category	Average Production lbs/ac	Vegetation	Percent Cover Litter	Total
Loamy	359	27.8	31.8	59.6
Loamy/Gyp Uplands	199	21.4	31.0	52.4
Loamy/Hills	540	35.7	28.9	64.6
Limestone Hills	305	22.5	17.7	40.2
Malpais	331	14.7	19.1	33.8
Sandy	380	15.1	40.2	55.3

Source: BLM RRA Inventory Files, 1981-1982

Without vegetation treatments, extensive range improvements, and grazing programs, ecological condition classes would not exhibit any measurable changes. Those acres currently in an upward trend would be expected to improve in condition; the reverse situation would be expected in areas which are on a downward trend. Overall, it is expected that the amount of Federal acres in each ecological condition class would remain at existing levels as shown in Table 3-2 and Table 3-3.

TABLE 3-2
(PA) LONG-TERM ECOLOGICAL CONDITION CLASSES

Ecological Condition Class	Existing (ac.)
Undetermined ("C") Category	93,666
Excellent	25,332
Good	510,108
High Fair	270,093
Low Fair	70,710
Poor	23,502

Source: RRA Inventory files

TABLE 3-3
(PA) ECOLOGICAL CONDITION BY RANGE CATEGORY
(FEDERAL ACRES)

Ecological Condition Class	Range Category											
	Loamy	Percent	Loamy/Gyp Uplands	Percent	Loamy/ Hills	Percent	Limestone Hills	Percent	Malpais	Percent	Sandy	Percent
Excellent	4,160	.4	0	0	0	0	19,892	2.0	0	0	1,280	.1
Good	108,436	10.9	9,124	.9	17,800	1.8	335,585	33.8	8,393	.8	30,770	3.1
Fair												
High-Fair +38	67,764	6.8	6,227	.6	8,200	.8	167,599	16.9	0	0	20,303	2.0
Low-fair -38	18,855	1.9	0	0	0	0	39,362	4.0	0	0	12,493	1.3
Poor	1,480	.2	0	0	0	0	17,742	1.8	0	0	4,280	.4
Undetermined a/	93,666	9.4	0	0	0	0	0	0	0	0	0	0
TOTAL	294,361	29.7	15,351	1.5	26,000	2.6	580,180	58.4	8,393	.8	69,126	7.0

Source: BLM RRA Inventory Files, 1982-1983.

a/ "C" Category allotments.

IMPACTS OF THE PA ON

LIVESTOCK GRAZING

Under the PA, no changes would be made in season of use or kind of livestock on any allotment. AMPs would continue to be under intensive management, while the remaining allotments would continue to be grazed based on the operator's choice (yearlong or deferment). Licensed use would remain the same at 228,656 AUMs, or about 9 percent below adjudicated preference (249,535).

IMPACTS OF THE PA ON

SOILS/WATERSHED

Current watershed conditions would generally remain the same under this alternative. Approximately 6 percent of the study area (59,605 acres) would continue to be in stable watershed condition, 79 percent (784,795 acres) in the slight erosion class, 13 percent (129,143 acres) in the moderate erosion class, and 2 percent (19,868 acres) in the critical erosion class. The area in the moderate and critical erosion classes (approximately 15 percent) would continue to erode top soil at higher than normal rates. In these isolated areas, erosion rates will vary from .50 ac.ft/sq.mi./yr. to 3.0 ac.ft./sq.mi./yr. Erosion and the subsequent sediment yields would not change due to the continuation of current management practices. Negative impacts from sediment include decreased water quality and increased sedimentation to area lakes, reservoirs, and ponds.

Change in surface or groundwater resources would be inconsequential. Water use by livestock (excluding evaporation loss) would remain at approximately 228,700 gallons per day, which converts to approximately 256 acre feet of water annually. This amount is less than 1 percent of all consumptive water use in the planning area. Water quality does not appear to be significantly affected from the current level of use.

IMPACTS OF THE PA ON

WILDLIFE

SPECIAL HABITAT FEATURES

Riparian areas would be expected to remain in or slightly below existing condition, in the long term. Other SHFs would not be affected by the proposed action.

BIG GAME

Desert mule Deer. Mule deer populations would be expected to remain at existing levels (approximately 1,800 mule deer on public land west of the Pecos River). Habitat would continue to be stable in fair to good condition.

Pronghorn Antelope. Pronghorn antelope numbers on public lands (excluding east Chaves County) would remain at approximately 385 animals. Habitat would be expected to remain in stable condition.

The current amount of AUMs reserved for big game use (4,489) is adequate to satisy existing numbers (2,604 AUMs).

GAME BIRDS

Mourning Dove. Mourning dove habitat would continue in its current condition. The birds' numbers would fluctuate as normal because of other environmental factors (primarily rain) but would remain at or near the present population within expected levels.

Scaled Quail. Habitat for scaled quail would remain in or near its current condition. Numbers of quail would not increase or decrease as a result of continued livestock grazing at current levels and would continue to fluctuate within expected levels.

IMPACTS OF THE PA ON

THREATENED AND ENDANGERED PLANTS AND ANIMALS

Existing Bureau programs are not known to be jeopardizing any T/E species. Under the PA, the Resource Area would continue to monitor its programs in coordination with USFWS, NMDG&F, and NMNHP to avoid jeopardizing T/E species.

IMPACTS OF THE PA ON

AIR QUALITY

Air quality is not expected to be impacted. Areas which are trending upward in watershed condition would improve the air quality in the long term. The areas which are in a downward trend would yield an increasing amount of dust particles to the atmosphere.

IMPACTS OF THE PA ON

CULTURAL RESOURCES

Uneven utilization of pastures by livestock would have both beneficial and negative effects on cultural resources. Areas heavily used by livestock could lead to greater potential for trampling of cultural resources by livestock. While the effects of cattle trampling can be partially mitigated for new facilities, the effects of trampling from existing facilities will continue. This is an impact which cannot be adequately quantified. On the other hand, in areas which are currently under utilized, for example areas some distance from water, the potential impact from cattle trampling would be minimal. Similarly, an increase in erosion would create beneficial as well as negative impacts. Increased erosion would uncover and disturb sites, however, the subsequent increase in siltation at another location could result in at least the partial burying of some cultural resources. This would provide some protection from unauthorized collection. The burying of sites, however, removes them from the known site population and further analysis.

Although no rangeland improvement projects or vegetation treatments are proposed in the PA, they are not precluded from future development in areas with existing plans (AMPs, Ft. Stanton, east Chaves County). Standard operating procedures for cultural resources would limit adverse impacts from construction of rangeland improvements. Potential impacts from vegetation treatments are greatest when the method to be used is grubbing (plowing). Chemical control and prescribed burning also have the potential for adverse impacts on cultural resources (these impacts are described in more detail in the DPA which does propose areas for vegetation treatments).

IMPACTS OF THE PA ON

RECREATION

Impacts to caves generated by hydrologic processes on deteriorating range sites would continue. Increased sedimentation and decreased infiltration would persist at the same rate or possibly increase in the immediate area of sinkholes and caves where watershed degradation is taking place.

Other recreation resources and use would not be significantly affected by this alternative. Recreation use would probably increase as society's amount of leisure time increases, following current trends.

IMPACTS OF THE PA ON

VISUAL RESOURCES

The proposed action contains no new components which would impact visual resources or reduce any management classes. No new introduction into the landscape of negative visual impacts from new grazing management systems or rangeland improvements would occur.

IMPACTS OF THE PA ON

SOCIOECONOMIC CONDITIONS

Under this alternative, the current level of management would continue. Neither socioeconomic conditions of the total economy nor that of the livestock industry would change due to BLM actions (Tables 3-4 and 3-5). Income and revenues generated by the recreational use of the public lands would remain the same as shown in Table 3-6.

TABLE 3-4
(PA) ESTIMATED RECEIPTS, COSTS AND RETURNS FOR ALL RANCH SIZE CATEGORIES IN THE ROSWELL AREA

ITEM	
Gross Income	6,031,975
Total Cash Costs	3,263,288
Returns Above Cash costs	2,768,687
Depreciation	1,314,543
Returns to Operator Labor, Management, and Capitol	1,454,144
TOTAL AUs a/ 32,432	

Source: BLM Roswell Resource Area EIS Files
a/ Includes Federal, State, and private AUs

See Appendix I, Tables I-4, I-8, I-12, I-16, and I-20 for estimated costs and returns for individual ranch size categories.

TABLE 3-5
(PA) PERSONAL INCOME AND EMPLOYMENT

	Jobs	Income
BLM Range Livestock Sector	195	$591,000
Related Livestock Sector	1,534	$10,320,000

Source: BLM RRA Input/Output (I/O) Model

TABLE 3-6
REVENUES AND INCOME FROM RECREATION
(dollars/year)

Activity	West a/	East b/
General Recreation	$330,193	
Hunting:		
Upland game a/	33,200	
Deer		
East b/		63,798
West c/	373,531	
Pronghorn Antelope		
East b/		4,239
West c/	22,349	
Prairie Chicken		
East b/		5,170
West c/	0	
TOTAL	$759,273	$73,207

Source: RRA Wildlife Files, Sage Ram, NMDG&F
a/ All species except Prairie Chicken
b/ Chaves County east of the Pecos River
c/ Excluding Chaves County east of the Pecos River

DISTRICT PREFERRED ALTERNATIVE (DPA)

The management direction prescribed in the DPA consists of a program of rangeland improvements, vegetation treatments, grazing systems, and short-term livestock-use-adjustments which would be used to correct unsatisfactory range conditions. Long-term stocking levels would be based on data accumulated from rangeland monitoring studies. These actions would occur on "I" category allotments in the order ranked by a benefit/cost analysis of each allotment.

The effects of proposed brush control for the area east of the Pecos River in Chaves County, were analyzed in the 1979 East Roswell Grazing EIS. The use of the herbicide Tebuthiuron for control of shinnery oak was not included in that analysis. The impacts of shinnery control in east Chaves County using Tebuthiuron will be analyzed under this alternative only. Individual allotment analyses which were presented in the East Roswell Grazing EIS and East Chaves MFP will not be repeated in this discussion.

Target stocking rates have been estimated based on predicted results which would occur from implementation of the DPA. Based on current monitoring data, it is estimated that a reduction of approximately 750 Animal Units (AUs) would occur in the short term on those allotments in the "I" category with low-fair and poor condition acreage. These AUs would either have to be sold or pastured on other lands owned or leased by the permittee. In the long-term, there would be a net increase over 5-year-average-licensed-use of approximately 1,450 AUs as a result of range improvements, vegetation treatments, and management. Table 3-7 displays the estimated short and long-term stocking rates.

TABLE 3-7
(DPA) ESTIMATED SHORT AND LONG TERM STOCKING RATES

	Livestock AUMs	Percent Change from Existing Situation
Existing Licensed Use	228,656	0
Short Term	219,695	-4
Long Term	246,028	+7

Source: RRA Inventory Files

The short-term adjustment of 8,961 AUMs is a 4 percent decrease from the 5-year-average-licensed use (existing situation). Long-term stocking rates reflect additional forage produced through the prescribed actions shown in Table 3-8.

TABLE 3-8

(DPA) MANAGEMENT PRESCRIPTION AND ESTIMATED PRODUCTION OF FORAGE a/

Action	Number		AUMs Produced
Brush Control (West of Pecos River)	47,372	ac	7,315
Burns	650	ac	143
Range Improvements			823
Barbed-wire fence	15.5	mi	
Net-wire fence	17.5	mi	
Water developments	38.0	ea	
Water pipeline	32.5	mi	
Grazing Systems	290,493	ac	9,091
	TOTAL		17,372
Shinnery Oak Control (East of the Pecos River)	153,820	ac	16,735 b/

Source: RRA Inventory Files

a/ See Appendices C-1 and C-3

b/ AUMs produced by brush control were addressed in the East Roswell Grazing EIS. This figure is not included in the total AUMs produced under the DPA.

IMPACTS OF THE DPA ON
VEGETATION

As a result of implementing the prescribed actions, no measurable change in forage production would occur in the short-term; total forage production would increase approximately 7 percent in the long term over the amount required to sustain the existing 5-year-average-licensed-use. Ground cover, consisting of grasses, forbs, and vegetational litter, would increase in each range category as shown in Table 3-9.

TABLE 3-9

(DPA) PERCENT COVER BY RANGE CATEGORY

Range Category	Percent Cover Existing	DPA
Loamy	60	70
Loamy/Gyp Uplands	52	53
Loamy/Hills	65	65
Limestone Hills	40	48
Malpais	34	34
Sandy	55	70

Source: RRA Inventory Files

Increased forage production, improved species composition, and additional cover would move all acres in poor condition and some of the acres in fair condition into an improved ecological condition class. The shift of acres between ecological condition classes is shown in Table 3-10. Table 3-11 displays the projected long term ecological condition classes by range category.

TABLE 3-10
(DPA) LONG-TERM ECOLOGICAL CONDITION CLASSES

Existing (ac.	Ecological Condition Class	With DPA (ac)
93,666	Undetermined ("C")	93,666
25,332	Excellent	25,332
510,108	Good	683,427
270,093	High-Fair	151,584
70,710	Low-Fair	39,402
23,502	Poor	0

Source: RRA Inventory Files

TABLE 3-11
(DPA) ECOLOGICAL CONDITION BY RANGE CATEGORY
(FEDERAL ACRES)

Ecological Condition Class	Range Category											
	Loamy	Percent	Loamy/Gyp Uplands	Percent	Loamy/ Hills	Percent	Limestone Hills	Percent	Malpais	Percent	Sandy	Percent
Excellent	4,160	.4	0	0	0	0	19,892	2.0	0	0	1,280	.1
Good	153,966	15.5	9,124	.9	17,800	1.8	457,070	46.0	8,393	.8	37,074	3.7
Fair												
High-Fair +38	36,796	3.7	6,227	.6	8,200	.8	76,572	7.7	0	0	23,789	2.4
Low-fair -38	5,773	.6	0	0	0	0	26,646	2.7	0	0	6,983	.7
Poor	0	0	0	0	0	0	0	0	0	0	0	0
Undetermined a/	93,666	9.4										
TOTAL	294,361	29.6	15,351	1.5	26,000	2.6	580,180	58.4	8,393	.8	69,126	6.9

Source: BLM RRA Inventory Files, 1982-1983.
a/ "C" Category allotments.

The following narrative describes the impacts on vegetation which would occur from brush control, prescribed burning, development of range improvements, and the implementation of grazing systems. Table 3-12 displays the acres in each range category proposed for brush control treatments. Refer to Table 3-8 for the estimated increase in AUMs produced.

TABLE 3-12
(DPA) ACRES TO BE TREATED BY RANGE CATEGORY

Brush Species	Range Category Loamy	 Limestone Hills	 Sandy
Mesquite	1,785		20,065
Cholla	14,410		
Creosote		1,970	
Snakeweed		8,142	
Shinnery oak (east of Pecos River)			153,820

Source: RRA Inventory Files, 1981-1982.

CHEMICAL BRUSH CONTROL

Chemical treatments should control at least 40 percent of the target brush species. Killing as little as 30 percent of the target species would increase perennial grass production and remove the dominance of brush by reducing the competition for available moisture (Leifeste 1971). Grass production would remain higher than levels prior to treatment for 7 to 30 years, depending upon the rate of brush recovery. Density of brush species may increase several years after treatment with no detectable reduction in grass production. Some form of maintenance treatment would be necessary within 10 to 20 years after the initial treatment (Herbel, et al. 1977).

Changes in plant composition would occur within 1 to 3 years following chemical application. Pelletized treatments would cause a gradual kill of brush species over this period, whereas foliar spray effects would be more immediate, usually killing plants by the end of the first growing season following treatment.

Approximately 2,000 acres of creosote, 20,000 acres of mesquite, and 8,100 acres of snakeweed west of the Pecos River would be treated with chemicals (Appendix C-1). Approximately 150,000 acres of shinnery oak would be chemically treated in the area east of the Pecos River (Appendix C-4). The four chemicals proposed for brush control are dicamba, picloram, 2,4,5-T, and tebuthiuron. Two combinations are also proposed - one is a tank mix of picloram and dicamba, the other is a mixture of 2,4,5-T and picloram.

Dicamba (trade name Banvel) is a herbicide effective for broadleaf weed and brush control. Mesquite can be substantially reduced or killed by using dicamba (Bovey 1977). Creosote is also susceptible to both a foliar spray and soil treatment of dicamba. Dicamba may be used in the form of granules for ground application (5% active ingredient per granule), or a water soluble liquid for aerial spraying.

Dicamba would be toxic to actively growing forbs. Those forbs that initiate growth while dicamba is still present would also be defoliated or killed (Bovey 1977). Forb production would increase after the herbicide had dissipated. Non-target brush species such as tarbush would be defoliated (Bovey 1977) along with the target species (creosote and mesquite). Residues of dicamba, either sprays or granular, would not persist in vegetation longer than one year after treatment, because it is susceptible to thermal degradation (Baur, et al 1974; Scifres and Allen 1973). Dicamba is resistant to photodecomposition, and would persist longer than 2,4,5-T (Baur, et al. 1974).

Picloram (trade names Tordon, Amdon, and Grazon) is a herbicide effective on some annual and perennial weeds. In a shortgrass vegetation type in Arizona, picloram produced a 95 to 100 percent kill of snakeweed (Little and Schmutz 1970). Past studies show picloram to be intermediately effective in controlling creosote (Schmutz 1967). Foliar sprays of picloram are effective in controlling mesquite (Bovey and Mayeux 1980), whereas soil applied pellets are ineffective (Meyer 1982; Kitchen, et al. 1980). Picloram may be used in the form of a water miscible liquid, pellets, or granules (10 percent active ingredient per granule).

Picloram use would prevent germination of grasses and would defoliate non-target shrubs in the treatment area, such as acacia. Other shrubs, such as pricklypear and sumac would be reduced or killed (Bovey 1977). Picloram would be more persistent in vegetation than dicamba, because it is resistant to microbial degradation in the soil (Scifres and Allen 1973).

The chemical 2,4,5-T is a selective herbicide effective on some woody plants and herbaceous broadleaf plants. Repeated application of 2,4,5-T over two to three years in Arkansas killed 95 percent of all woody plants (Davis 1967). Past studies have shown that creosote and mesquite are effectively controlled by aerial sprays of 2,4,5-T (Bovey 1977; Schmutz 1967). Soil treatments of 2,4,5-T are ineffective on mesquite (Bovey and Mayeux 1980). During the spring months of April and May, 2,4,5-T produced a significant kill of snakeweed (Little and Schmutz 1970). This herbicide may be used in the form of an emulsifiable concentrate, a water miscible liquid, or a water soluble salt.

The use of 2,4,5-T would have little effect on grasses and shrubs growing in association with the target species, but would defoliate or kill some forbs present in the treatment area (Sosebee and Dahl 1979). Forb production would begin increasing during the third growing season following treatment. Since 2,4,5-T is susceptible to microbial degradation in the soil (Scifres 1975), it is shortlived in plants. The chemical has been found to be reduced to trace amounts six months after treatment (Baur, et al. 1969).

Tebuthiuron (trade name Graslan) is a nonselective herbicide effective on some woody plants and weeds. It has been effective in controlling creosote at low rates of application. Higher rates (2 pounds per acre) are effective in controlling mesquite (Baur 1978; Sosebee 1979). Tebuthiuron may be used in the form of a wettable powder, pellets, or spikes.

In December, 1980, 120 acres of shinnery oak in the East Roswell Grazing EIS area were experimentally treated with tebuthiuron pellets. The pellets were aerially applied at rates of .25 lb., .50 lb., and 1.0 lb. 10 percent (P) active ingredients per acre. Results are as follows:

Plot	Grass and Forb Production (lbs/acre)		
	1981	1982	1983 a/
Untreated	584	282	176
.25 lb. 10P	573	1298	498
.50 lb. 10P	745	2171	722
1.00 lb. 10P	676	1233	326

In December 1980, 30 acres of mesquite were experimentally treated with tebuthiuron. The pellets were applied at 1.5 lb. 20P and 40P active ingredients per acre. Results follow:

Plot	Grass and Forb Production (lbs/acre)		
	1981	1982	1983 a/
Control	433	194	30
1.5 lb. 40P	516	432	82
1.5 lb. 20P	612	890	280

Tebuthiuron use to control shinnery oak east of the Pecos River would damage non-target brush species such as fourwing saltbush, sumac, and sandsage (Petit 1977). Herbel (1977) found that injury to established grasses and forbs can be reduced by applying tebuthiuron during winter months. Tebuthiuron is not readily decomposed by soil microbes, therefore, trace amounts have been detected in vegetation up to two years after treatment (Bovey et al. 1982). Application at the rate of .5 lb. 10P per acre has produced a 95 percent kill of shinnery in some portions of the experimentally-treated area.

A site-specific Environmental Assessment would be prepared prior to vegetation treatments to determine the site-specific impacts. All applications of herbicides would be determined based on individual range sites, and the conditions at the time of application.

MECHANICAL BRUSH CONTROL

Vegetation composition would be altered by mechanical grubbing (plowing) of approximately 1,800 acres of mesquite and 14,000 acres of cholla cactus (Appendix C-1). Approximately 80 to 95 percent of the target shrubs in the grubbed area would be killed. A 5 to 20 percent regrowth rate would occur from plants missed during the initial treatment. Most grasses and forbs growing beneath the target species would also be killed (Rechenthin, et al. 1964). Mesquite seedlings would reestablish from residual seed in the soil, and must later be controlled (Jaynes 1968). Although grubbing favors the spreading of cholla by transplanting broken plant parts (Hoffman 1967) the cholla could be stacked and left in place, or burned after treatment to prevent spread.

a/ Precipitation received during the 1983 growing season was one-half the average amount.

The response of vegetation following grubbing would depend upon precipitation received after treatment. During periods of normal precipitation, forage plants in the impacted area may require at least two years to reach production levels which existed prior to treatment (Brock et al. 1978). If drought conditions begin after grubbing, however, forage production may not recover for many years (Brock et al. 1978). The pits that remain after target species are removed by grubbing would increase penetration of rainfall. This, in turn, would aid in the establishment and production of grass seedlings (Stoddart, Smith, and Box 1975).

PRESCRIBED BURNING

Prescribed burns, proposed on approximately 650 acres of alkali sacaton and giant sacaton swales (Appendix C-1), would have an affect not only on sacaton, but other plant species growing in the burn area. Most of the swales have cholla, pricklypear, and mesquite growing in association with the sacaton. Burning would kill approximately 50 percent of small mesquite plants less than 0.5 inches in diameter (Glendening and Paulsen 1955), and would significantly decrease mesquite seedling establishment (Cable 1967). Mature mesquite would be defoliated, but less than 10 percent would be killed (Reynolds and Bohning 1956). Cholla and pricklypear mortality would be as high as 85 percent (Wright 1974).

Time of burning and burning conditions can markedly affect plant response. Burning sacaton swales during wet years would more than double production, but in a dry year burning may decrease production by a third (Wright 1972). Undesirable annual plants, such as annual broomweed, would be easily controlled by spring burning (Wright 1969). Spring burns would also favor warm season perennial grasses (Wright 1974), whereas early summer burns would favor annual grasses. Burning would stimulate herbaceous plant growth to begin one to three weeks earlier than normal. Use of sacaton swales by livestock and wildlife would be increased for 6 months to 1 year or longer following burning due to the reduction of coarse, unpalatable growth (Heirman and Wright 1973; Klett, et al 1971).

RANGE IMPROVEMENTS

The location of water developments on rangeland is important in controlling the movement, distribution, and concentration of livestock. Uneven utilization of forage plants results from improper distribution of watering facilities (Valentine 1979). Cattle will graze areas around water again and again, rather than travel long distances to better forage. This results in heavy utilization of forage near water and wastes forage at long distances from water (Philipp 1961). Construction of watering facilities will reduce the size of the over utilized (and under utilized) areas. Thirty eight (38) additional livestock waters would be developed, along with 32.5 miles of water pipeline.

Intensive and effective management of rangelands is dependent upon adequate fencing (Valentine 1979). Additional fencing would permit periodic rest of pastures, and regulate season of use (McNamee and Kinne 1965). This would allow forage plants to regain vigor, resulting in increased forage production. Fencing also provides better distribution of grazing, and less trampling damage to grasses and forbs.

Approximately 17.5 miles of woven net wire fence would be erected in (non-antelope) areas currently encompassed by and cross-fenced with net wire. Net wire fences would not be constructed in areas currently fenced with barbed wire. Approximately 15.5 miles of barbed wire fence would be constructed and would adhere to BLM fencing specifications in big game use areas.

Short term disturbance to vegetation following construction of the range improvements would be minimal. In the long term, approximately one acre of vegetation would be sacrificed around each new water facility.

GRAZING SYSTEMS

Herbaceous plants are most vulnerable to grazing during the growing season (July through October) when rapid growth coincides with minimum nutrient reserves. Herbaceous plants are least damaged by grazing during the dormant season (November through June) when food storage is complete. Grazing during the dormant period can be the most damaging to shrubs because nutrient storage is in the twigs and stems instead of in the roots. If a plant is consistently over utilized, it can not store enough reserves to carry it through the winter, and grow the following spring. The result is a reduction in forage production in the summer (Martin 1970). Allowing rest during the growing season (grazing system) would solve this problem by allowing the plant to replenish its root reserves, grow new root material for nutrient uptake, and produce seed (NM Interagency Range Committee 1970). Longer rest periods would allow desirable woody plants and grasses sufficient time to complete their reproductive cycle and improve vigor.

IMPACTS OF THE DPA ON

LIVESTOCK GRAZING

CHEMICAL BRUSH CONTROL

The use of livestock deferment for two consecutive growing seasons on treated pastures is required after chemical treatment. A decrease in livestock numbers may be necessary during this deferment period, if the remainder of the allotment cannot support the livestock that normally utilize the treated pastures.

MECHANICAL BRUSH CONTROL

Deferment of livestock grazing for two consecutive growing seasons is required after grubbing to allow desirable plants to regain vigor. Livestock numbers may need to be adjusted to the capacity of the remaining pastures on the allotment.

PRESCRIBED BURNING

Following burning, large amounts of palatable forage would become available. Livestock numbers may be increased in order to utilize this forage. Prescribed burns would reduce wildfire hazard, which could be injurious to livestock.

RANGE IMPROVEMENTS

Range fencing and water developments facilitate the handling of and caring for livestock. Anticipated benefits from added fencing include enhanced breeding operations, greater ease in regulating stocking rates and separating animals by kind, sex, age or stage of reproduction. Fencing would also aid in controlling straying and trespassing of livestock. Injury of livestock can be decreased by excluding livestock from hazardous areas. Water developments would lessen the distance livestock have to travel between forage and water, resulting in better livestock distribution within a pasture. Improved distribution would facilitate more even utilization of the available forage resulting in an increase in livestock production.

GRAZING SYSTEMS

When livestock are moved to a new pasture under a grazing program or system, a weight loss could occur until livestock became acquainted with water locations and preferred grazing areas within the pasture (Valentine 1979). After livestock become familiar with the pastures, they would make better gains since forage would be available (Schmutz 1973).

Grazing programs which require less than one year's rest would normally not require a decrease in livestock numbers, because all available livestock forage would be accessible during various times of the year. Grazing systems requiring a one year or more rest may require a reduction in livestock numbers during the cycle's first year because forage in the pastures being rested would not be available.

IMPACTS OF THE DPA ON

SOILS/WATERSHED

Chemical treatments would have a short-term negative impact on soil erodibility. After the chemical treatment kills the target plant species and they are defoliated, wind and water erosion would increase on soils which are presently stabilized by these species. Treated areas would be on soils and range sites which have high wind erodibility group ratings. The greater effect would be on soils with sandy surfaces. Dunes which are presently stabilized by mesquite growth would be expected to undergo a physiographic change after the mesquite defoliates and dies following chemical treatment. These soils would be expected to drift under the effect of winds, tending to level some dunes. Grasses and forbs would become reestablished and would exceed pretreatment production levels within two to three years. In creosote and snakeweed areas, the initial soil movement after defoliation would be slight. These species, because of their growth form, do not stabilize soil well. In the long term, soil erosion and sediment yields would decrease from the treated areas.

Mechanical treatment of cholla is expected to have a short-term negative impact to the watershed. Increased wind and water erosion would occur during treatment. Soils would be disturbed making them more susceptible to erosion. The soils treated would be, for the most part, Loamy range sites with soil surface textures of loam, sandy loam, and clay loam. In the long term, grasses and forbs would reestablish and would exceed pretreatment production levels within two to three years, and soil erosion and sediment yields would decrease.

Prescribed burning of sacaton areas would have a short term negative impact to watershed. Following burning, the soil surface would be left bare of ground cover. Sediment could be displaced and transported easily at this time by runoff. At the preferred times of treatment, however, storms producing runoff are not common in the area. During the spring, vegetation would reestablish, stabilizing the treated areas. The treated areas would be loamy range sites and swales, with soil textures of loam, clay loam, and clay. In the long-term, no significant impact to watershed would occur.

Sedimentation of surface water could occur in some areas from construction of fences, pipelines, and livestock waterings. Sedimentation would be short term during construction of the fences and pipelines. In the long term, no significant impacts on surface water would occur. Impacts on water would depend on the locations of the watering site in relation to stream channels and other water sources. Watering sites are not expected to have a significant impact on water quality.

With the use of grazing systems or programs in allotments, watershed conditions would be expected to improve in the long term. Increased vegetation production and ground cover would decrease soil erosion and sediment yields. Water pollution from sedimentation would decrease.

Surface runoff would remain the same for all range sites except the Loamy range site, which would decrease 18 percent. Soil erosion would be decreased and sediment yields reduced from .40 ac.ft./sq.mi./yr. to .30 ac.ft./sq.mi./yr. Erosion classes would be improved as shown in Table 3-13.

TABLE 3-13
(DPA) LONG-TERM CHANGE IN EROSION CLASSES

Existing (ac)	Class	with DPA (ac)
59,605	Stable	61,605
784,795	Slight	787,795
129,143	Moderate	131,143
19,868	Critical	12,868

Source: RDO Watershed Files

Water consumption by livestock is expected to increase in the long term from an average 228,700 gallons per day to 246,000 gallons per day. The increased use is less than 1 percent of the consumptive use in the planning area and would not present any significant problem to existing water supplies. Water quality would improve due to a decrease in runoff and sediment yields.

IMPACTS OF THE DPA ON
WILDLIFE

SPECIAL HABITAT FEATURES

Riparian habitat (1,650 acres) would be protected from impact of vegetation treatments by the standard operating procedures listed in Chapter 1.

Present livestock utilization of riparian areas would continue. No significant decline (or improvement) from the present fair to good ecological condition is anticipated resulting from the anticipated long-term stocking rate. Other SHFs would not be impacted by the prescribed actions.

BIG GAME

Desert Mule Deer. Approximately one third of mule deer habitat on public land (supporting an estimated 1,800 deer) would be affected by the rangeland improvement program. The prescribed program would establish monitoring studies, adjust stocking rates, develop range improvements and vegetation treatments, and establish grazing programs on "I" category allotments (290,500 acres). All the range improvements and treatments would be located on these allotments (Appendix C-2).

Desert mule deer in the west Roswell area are primarily found in draws containing brush. Chemical brush control in these areas is restricted by standard operating procedures (Chapter 1). Large scale brush control may seriously affect local deer populations by removal of food and cover, however, Wiggers (1983) suggests that high density brush, over 50 percent aerial cover, is not preferred by desert mule deer. Therefore, limited control in areas of greater than 50 percent aerial shrub cover should not seriously harm, and may actually improve, local populations. Areas of brush control greater than 1 or 2 sections, without islands of cover at least 900 feet in width (Kerr 1979), and having 30 percent aerial shrub cover (Wiggers 1983) would be detrimental to local populations of desert mule deer. Brush control leaving adequate cover and food as described above would improve existing habitat.

The 38 new water developments (see Appendix C-1) would improve water distribution and reduce the distance travelled by wildlife to water. The prescribed range improvements, vegetation treatments, and grazing systems would result in improved ecological condition on approximately 365,000 acres. The improved habitat would support an estimated 300 additional mule deer (total of 2,100 deer).

Approximately 300 desert mule deer are found on public land throughout the Roswell area east of the Pecos River in Chaves County. The habitat is stable in fair to poor condition. Research conducted by Krysl, et al. (1979) within shinnery oak habitat near Palo Duro Canyon, Texas, showed shinnery to be the most important food item, comprising approximately 37 percent of the annual diet. Other studies throughout New Mexico and Texas (Stewart 1959, cited by Krysl 1979; Boeker, et al. 1972; and Anderson et al. 1965, cited by Krysl 1979) found other oak species to be similarly important in mule deer diets. Boeker, et al., (1972) suggested that oak browse was a major yearlong dietary item because of high availability in the habitat. He also found a seasonal shift to generally more nutritious forb species with respect to availibility and deer preference. This suggests that deer could shift from a shinnery diet to a forb diet during spring, summer, and fall and still maintain physical condition. During winter, however, food availability would be greatly reduced due to the decrease in shinnery density and seasonal loss of forbs. Either deer survival would be greatly affected or the deer would move to areas with better forage availability. Leaving areas of uncontrolled shinnery within each sprayed pasture would provide areas for deer to browse during those periods when shinnery is a major food item. The literature deals primarily with creating brush openings (Schmidt and Bilbert 1978, Derr 1979) as a management tool. Little is said about leaving brush to preserve deer populations in large scale brush control projects. Arness (1974, cited by Wallmo 1981) suggested that in treating Arizona chaparral no more than 50 percent of an area should be treated and that control areas should not exceed 300-400 yards in width. He also suggested that large treated blocks were not compatible with optimum habitat diversity.

The prescribed brush control would leave 20 to 30 percent of existing shinnery with adequate distribution for mule deer use. This would provide a diverse habitat capable of supporting deer through critical periods. As a result, the improved habitat would support an additional 218 mule deer (for a total of approximately 500).

Pronghorn Antelope. Improved ecological condition on approximately 365,000 acres (excluding east Chaves County) would provide additional forage for pronghorn. The development of 38 new water facilities would provide better water distribution for pronghorn and reduce the distances traveled for water.

Increased forb production would result from brush control on approximately 47,200 acres of public land within the "I" category allotments (excluding east Chaves County). The improved habitat resulting from additional forage and the 38 new water sources would support an additional 84 pronghorn (for a total of 469).

Total demand for big game AUMs (deer and antelope) would be 3,052 AUMs, out of the 4,489 AUMs currently reserved for wildlife.

The Roswell area, east of the Pecos River, supports approximately 219 pronghorn on the shinnery oak habitat on public land. Habitat would be improved by decreased brush density (Yoakum 1980) and increased forb availability resulting from shinnery oak control. Forb densities would initially decrease due to herbicide effects, but are expected to increase above previous levels after herbicide dissipation. The improved habitat would support approximately 365 pronghorn.

GAME BIRDS

Mourning Dove. Dove would likely benefit from increased food sources resulting from the improved ecological condition on 365,000 Federal acres and brush control on 47,000 acres, west of the Pecos

River. Removal of brush would not seriously affect dove nesting habitat, as rangeland brush is not used extensively by doves for nesting because it is too short (Lamb and Pieper 1971).

Shinnery oak control, east of the Pecos, would benefit Mourning doves primarily from increased grass and forb densities and subsequent seed availability. Nesting would be little affected as shinnery habitats are not important dove nesting areas. The number of dove using this habitat is not expected to change appreciably.

Scaled Quail. Control of brush species, especially mesquite and cholla would be detrimental to quail because of loss of escape/resting cover (Sawyer 1973). Stormer (1980) found cholla to be a major loafing covert (protective shelter) where it occurs. Leaving areas interspersed with cholla [1 covert per 10 acres (Stormer 1982)] and mesquite would help maintain quail numbers.

Snakeweed has been shown to be an important quail food in southeastern New Mexico (Davis and Banks 1973), however, scaled quail easily adapt to changing food conditions because they are opportunistic feeders (Howard 1981). Increased densities of other large seeded forbs and grasses would benefit them. Snakeweed control would have little detrimental effect on quail.

Quail would benefit from the rangeland improvement program proposed. The improved ecological condition resulting from the prescribed management would provide increased availability of large-seeded forbs and grasses. Quail numbers would be expected to remain the same or slightly increase .

Shinnery oak control east of the Pecos River would benefit scaled quail from the increased forb availability following control. Interspersed areas of uncontrolled shinnery oak would provide the diverse habitat for scaled quail to obtain their dietary needs (insects).

Lesser Prairie Chicken. Shinnery control was once believed to be detrimental to lesser prairie chicken populations because it removed an important food supply (USDI BLM 1979). Lesser prairie chickens in the East Roswell area require higher medium and tall grass densities for nesting (particularly bluestems) than are available in a large part of their habitat in this area (Davis et al. 1979). High-density shinnery/low-density grass limits lesser prairie chicken populations in this area. Research conducted by Jones and Pettit (1980) indicates that once shinnery invades an area, competition for soil water prevents reestablishment of grass species. Control of shinnery releases this competition and allows grass to recover.

Davis et al. (1979) also indicated that dense shinnery cover is an important habitat component during summer and winter. Food habits shift to shinnery acorns during winter, indicating a need for dense shinnery as well as grassy habitats. During summer, chickens with broods feed in dense shinnery areas due to the greater availability of insect foods and protective cover it affords. Preferred lesser prairie chickens habitat contains approximately 25 percent sand bluestem and 30 percent shinnery (Davis et al. 1979).

The prescribed shinnery oak control would leave 20 to 30 percent shinnery oak and some areas of dense shinnery. If current levels of shinnery oak were reduced to 30 percent and sand bluestem increased to 20 to 25 percent, chicken numbers would be expected to increase from 2,600 to 3,700 birds, although numbers would fluctuate annually as normal.

IMPACTS OF THE DPA ON

THREATENED AND ENDANGERED PLANTS AND ANIMALS

Both baird's sparrow and McCown's longspur are prairie sparrows (Hubbard et al. 1979). The improved ecological condition class on 173,000 acres would improve the habitat for these birds. Brush control would convert shrublands to grasslands, improve habitat for nesting, and increase food availability.

The trans-pecos rat snake is an inhabitant of arid to semi-arid, rocky, desert shrub areas (Hubbard 1979). Preferred habitat includes creosote brush habitats (Stebbins 1954). Control of 1,970 acres of creosote would be detrimental to this species unless islands of creosote brush were left scattered throughout the control area. Site by site analysis would occur and consultation with NMDGF would be carried out.

Guadalupe milkvetch is found on stony limestone hills and plains. It is an uncommon cool season perennial. Brush control could adversely affect this species by directly killing plants. Field checks, prior to brush control, would be required to ensure this species is not found within proposed spray areas. Mitigation would be limited to preserving those habitats where it is found. The Guadalupe milkvetch may be affected by livestock grazing, however, the extent of the impact is unknown.

Davis cholla is a relatively common inhabitant of limestone canyon and plains habitats that may or may not be infested with mesquite. Chemical or mechanical control in these areas would adversely affect the Davis cholla. Field checks prior to treatment of mesquite would be required to ensure protection of this species. Mitigation would consist of preserving occupied habitat.

Zephyr lilies are inhabitants of alkaline soils on plains habitats in the area of concern. Brush control would adversely affect this species. Field checks prior to brush treatment would be required to ensure survival of this species. Mitigation would consist of preserving habitat.

Only two T/E species occur within the shinnery habitats under consideration for control. These are the sanddune sagebrush lizard (State Group II) and Baird's sparrow (State Group II). No Federal listed or candidate plants or animals occur in the area. No state plants of special concern occur in the area.

Control of 150,000 acres of shinnery oak in the East Roswell area, without specific mitigating measures, would be detrimental to the sanddune sagebrush lizard. Naturally occurring dune stabilization and low population densities (3.0 to 4.8/ac) prompted the listing of this species as State Endangered Group II, and the proposal for Federal listing. Degenhardt and Sena (1976) and Egbert (1979) described 4 habitat types within the shinnery community - sand flats, oak sand hummocks, dune interface, and open dunes - and indicated that stabilization of dune/blowout shinnery habitat would critically lower sanddune sagebrush lizard densities. Shinnery control using tebuthiuron would greatly speed up the dune stabilization process. Both oak/sand hummocks, and dune interface habitats are considered preferred habitat, and are usually found within the readily identifiable SCS SD-3 sandhills range site. To mitigate potential adverse impacts on the sanddune sagebrush lizard population, essential lizard habitat would be maintained in the SD-3 sandhills range site in each spray pasture.

Baird's sparrow would benefit from control of shinnery through the increase of grass and forb density and subsequent increase in seed availability. Hubbard et al. (1979) suggested that grasses may be the most important food item. The change from a shrubland to a grassland may increase the amount of existing habitat for this species.

IMPACTS OF THE DPA ON

AIR QUALITY

The use of herbicides in granular form would not affect air quality. The use of liquid sprays would have minimal short-term, localized effects on air quality. The hazard of herbicides drifting during aerial spray applications would be dependent upon weather conditions, the distance droplets must fall, and the size of the droplets. Volatilization and drift would be reduced when aerial spray applications occur under the following conditions: air temperature is less than 85 degree F, wind velocity is less than 7 mph, precipitation is not imminent, application is at 50 feet or less above the ground, droplet size is greater than 200 microns, and aircraft air speed is less than 100 mph. The standard operating procedures outlined in Chapter 1 would reduce the hazards of chemical applications.

Mechanical brush control would produce localized generation of dust during operations. The addition of these particulates to the air would be of short duration and would have minimal impacts on the air quality of the area. Until vegetation is reestablished on these areas, there would be localized, short-term impacts resulting from dust being blown into the air during periods of high velocity winds, especially during the spring months.

Construction of rangeland developments would create localized generation of dust during actual construction. This would be of short duration and would have minimal impacts on the air quality of the area.

Air quality would be locally affected during prescribed burning, and for a short time after. In addition to the smoke produced, air borne cinders and particulates would be generated. These impacts would be of short duration and would have little effect on the air quality of the area at large.

IMPACTS OF THE DPA ON

CULTURAL RESOURCES

Standard operating procedures for cultural resources should limit adverse impacts on cultural resources. Herbicides and the associated diesel carriers have the potential of contaminating material which would be useful in radiocarbon dating by adding modern carbon to the material. This contamination would result in an inaccurate date. In order for the contamination to occur, however, the herbicide and/or diesel carrier must penetrate the soil profile. The majority of the diesel would be expected to evaporate before it has a chance to enter the soil profile. Sandy soils would be easier for the herbicides to penetrate, however, only 13 percent of the cultural resource sites recorded on public land on the west side of the Roswell Resource Area were located in sandy terrain. In the event of sample contamination, most radiocarbon laboratories anticipate the inert carbon could be removed if they knew in advance that the sample was contaminated (Las Cruces/Lordsburg EIS, 1983).

The standard operating procedure for cultural resources and herbicides requires BLM to notify an archaeological researcher if the archaeological site is located in an area that had been chemically treated. This information would allow both the researcher and the radiocarbon lab to compensate for any possible contamination.

Although a cultural resource survey would be required prior to undertaking mechanical brush control (grubbing), more potential for conflict exists between this type of brush control and cultural resources, especially within 1500 feet of a live stream. The presence of cultural sites could limit where grubbing could occur. Islands of mesquite left to avoid cultural resources, however, could "flag" these sites for unauthorized collectors.

Little to no direct impacts on cultural resource sites from burns would be anticipated since burns would be limited to draws (drainages). There is no causal relationship between the buried prehistoric sites and the likelihood of burning an historic site. Siltation within the drainage would probably have buried any prehistoric site. Since most historic sites were constructed of stone due to scarcity of wood in the environment and are not usually located in the drainage itself, the chances of burning a historic structure are remote. Along the edges of the draws, high probability of site occurrence exists. In these areas, the potential for impact from fire equipment exists. This is the area in which a minimun of a reconnaissance survey should be conducted.

Impacts occur from rangeland construction activities such as fence building, and also from the maintenance and use of fences (i.e. two-track ways along fences, cattle drifting along fences). The impacts from livestock waterings are much larger than the area occupied by the facility itself due to intensive livestock use around the waters.

IMPACTS OF THE DPA ON

RECREATION

Under this alternative, recreation use has the potential to greatly increase. This increase would be attributed to an anticipated increase in deer, antelope, and prairie chicken numbers. The gain in wildlife numbers would increase recreation use by improving hunting opportunities. Table 3-14 displays estimated increases in hunting/recreation visitation.

TABLE 3-14
(DPA) HUNTING/RECREATION VISITATION

Activity	Existing Situation		with DPA	
Hunting				
Deer				
Visitor Hours:				
West side a/	52,536		62,116	
East side b/		8,973		14,287
Pronghorn Antelope				
Visitor Hours:				
West side	2,620		3,191	
East side		497		828
Prairie Chickens				
Visitor Hours:				
East side		1,536		2,220
Total Hunting				
Visitor Hours:				
West side	55,156		65,307	
East side		11,006		17,335

Source: RRA Wildlife Files, NMDG&F
a/ The Roswell Resource Area excluding Chaves County east of the Pecos River
b/ Chaves County east of the Pecos River

The affect of vegetation removal on the watershed could produce some short-term impacts to cave resources in the form of increased erosion from surface disturbance. This impact could be mitigated by avoiding surface disturbance in the drainage basins and sink holes with significant cave resources, and by taking other steps necessary to protect these resources. The long-term effect of brush control would be increased water infiltration and reduced erosion once grasses and forbs are established. This would benefit caves by restoring a more natural condition to the surface lands and hydrologic cycle of the area. Direct impacts to some caves from livestock would still persist in cases where livestock have deteriorated the watershed in the cave areas.

Because of the impact of grazing on Torgac cave resource, measures would be taken to preserve and protect the watershed above the cave. To insure adequate protection of the area, livestock would be excluded from 22 acres directly above the cave and entrance sinkhole. This action would remove less than 2.5 AUMs from the available forage on the allotment. The exclosure would ensure protection of the cave resource as well as preventing any additional livestock from being trapped in the cave's sinkholes.

IMPACTS OF THE DPA ON VISUAL RESOURCES

Vegetation modification projects (brush control, prescribed burning) would create a short-term adverse impact on visual resources.

In the long-term, visual enhancement would be anticipated through improved rangeland condition and increased plant diversity.

Depending on the attitude of the viewer, range improvements could be either an adverse impact or a visual enhancement. Windmills, for example, are perceived as visually enhancing to the landscape by some viewers, although others view them as a distraction. In general, range improvements will have a minor adverse impact on visual resources.

Visual resource contrast ratings would be developed for each treatment. This information would be addressed in the environmental assessment for each project along with measures to mitigate or minimize adverse visual impacts.

IMPACTS OF THE DPA ON SOCIOECONOMIC CONDITIONS

Primary impacts of this alternative would be felt by the ranch operator; secondary effects would be felt by those employed by the ranchers and those employed in the related livestock sector.

PRIMARY IMPACTS

In the short term as adjustments to authorized stocking rates occur, total herd size (includes all animals grazed on private, State and Federal lands) would be reduced. These reductions would vary between ranch size categories as follows:

Small commercial cow-calf ranch	-23.6%
Medium commercial cow-calf ranch	- 2.2%
Large commercial cow-calf ranch	- 1.6%
Medium commercial sheep/cow-calf ranch	- 1.6%
Large commercial sheep/cow-calf ranch	- 0.4%

These reductions move 1 medium cow-calf operation to the small category.

As the herds are reduced, income would increase from increased sales. This increase would be shortlived and would fall rapidly as a result of reduced production. Ranch values would decrease by approximately $816,000. Most ranchers would probably continue to ranch, however, despite poor economic returns by increasing the efficiency of their operations through increased calving percentages, increased selling weights of livestock, by leasing more expensive private or State land, or by not making full allowance for depreciation. Table 3-15 compares the short term of effects of the DPA to those of the PA (existing situation).

TABLE 3-15
(DPA) SHORT-TERM ESTIMATED RECEIPTS, COSTS, AND RETURNS FOR ALL RANCH SIZE CATEGORIES IN THE ROSWELL RESOURCE AREA

Item	PA	DPA	Percent Change from PA
No. of Operators	76	76	
Gross Income	$6,031,975	$5,921,318	-1.8
Total Cash Costs	3,263,288	3,190,275	-2.2
Returns above Cash Cost	2,768,687	2,731,043	-0.9
Depreciation	1,314,543	1,314,543	NC
Returns to Operator Labor, Management, and Capital	1,454,144	1,416,500	-2.5
Total AUs a/	32,432	31,752	-2.0

Source: BLM RRA EIS files

a/ Includes Federal, State and private AU's.

See Appendix I TABLE I-2, I-3, I-7, I-11, I-15, and I-19 for estimated costs and returns for individual ranch size categories.

As the levels of authorized use increase over the long term, herd sizes would increase and would vary between the ranch categories as follows:

Small commercial cow-calf ranch	25.3%
Medium commercial cow-calf ranch	3.2%
Large commercial cow-calf ranch	6.0%
Medium commercial sheep/cow-calf ranch	4.1%
Large commercial sheep/cow-calf ranch	2.0%

These increases would move 3 small cow-calf operations and 2 medium cow-calf operations up to the next higher category. Ranch income would increase as would ranch values. Ranch values would increase, above the value in the PA, by approximately 1.6 million dollars. Table 3-16 compares the long-term returns of the DPA to those of the PA.

TABLE 3-16
(DPA) LONG TERM ESTIMATED RECEIPTS, COSTS, AND RETURNS FOR ALL RANCH SIZE CATEGORIES IN THE ROSWELL RESOURCE AREA

Item	PA	DPA	Percent Change from PA
No. of Operators	76	76	
Gross Income	$6,031,975	$6,269,240	+3.9
Total Cash Costs	3,263,288	3,400,382	+4.2
Returns above Cash Cost	2,768,687	2,868,858	+3.6
Depreciation	1,314,543	1,314,543	NC
Returns to Operator Labor, Management, and Capital	1,454,144	1,554,315	+6.8
Total AUs a/	32,432	33,780	+4.1

Source: BLM Roswell District EIS files

a/ Includes Federal, State and private AU's.

See Appendix I TABLE I-4, I-8, I-12, I-16, and I-20 for estimated costs and returns for individual ranch size categories.

SECONDARY IMPACTS

The effects of this alternative on those employed by the rancher and in the related industries are shown in Table 3-17.

TABLE 3-17
(DPA) CHANGES TO EMPLOYMENT AND PERSONAL INCOME

	BLM Livestock Industry		Related Livestock Industry		Total	
	Jobs	Income	Jobs	Income	Jobs	Income
Short-term loss	4	$ 10,700	3	$ 35,000	7	$ 45,700
Short-term gain a/	38	530,606	21	177,054	59	707,660
Long-term gain	7	23,000	7	75,000	14	98,000

Source: BLM RRA Input/Output (I/O) Model
a/ Gains in employment and personal income are short term and are generated by the expenditure of approximately 1.4 million dollars for range improvements.

This alternative would increase the revenue and income (Table 3-18) from the recreational uses of the public lands by approximately $73,000 excluding east Chaves County, and an additional $43,000 from east Chaves County. The increased income is caused by increased populations of mule deer and antelope on both sides of the Pecos River and increased lesser prairie chickens in the east Roswell area.

TABLE 3-18
COMPARISON OF REVENUES AND INCOME FROM RECREATION
BETWEEN PA AND DPA
(dollars/year)

Activity	PA		DPA	
General Recreation	$330,193		$330,193	
Hunting:				
Upland Game a/	33,200		33,200	
Deer				
East b/		$63,798		$101,581
West c/	373,531		441,644	
Pronghorn Antelope				
East b/		4,239		7,063
West c/	22,349		27,219	
Prairie Chicken				
East b/		5,170		7,357
West c/	0		0	
TOTAL	$759,273	$73,207	$832,256	$116,001

Source: RRA Wildlife Files, Sage Ram, NMDG&F
a/ All species except prairie chicken
b/ East of Pecos River
c/ West of Pecos River

INDUSTRY PREFERRED ALTERNATIVE (IPA)

This alternative, offered by the New Mexico Department of Agriculture and the Southeastern New Mexico Grazing Association, prescribes a program of vegetation treatments and rangeland improvements without extensive BLM grazing management. High priority is given to privately funded range improvements. Prescribed actions would occur on 25 "I" category allotments, and would be ranked by priority on a benefit/cost analysis. Estimated short and long-term stocking rates are displayed in Table 3-19.

TABLE 3-19
(IPA) ESTIMATED SHORT AND LONG-TERM STOCKING RATES

	Livestock AUMs	Percent Change from Existing Situation
Existing Licensed Use	228,656	0
Short Term	219,695	- 4
Long Term	236,937	+4

Source: RRA Inventory Files.

The short term reductions in stocking rates reflect adjustments based on range condition. Current monitoring data indicates a reduction of approximately 750 Animal Units (AUs) would occur in the short-term from "I" category allotments. These animals would have to be sold or pastured on other lands owned or leased by the permittee. Long-term stocking rates (approximately 700 AUs over the current 5-year-average licensed-use) reflect additional forage produced through the prescribed actions shown in Table 3-20.

TABLE 3-20
(IPA) MANAGEMENT PRESCRIPTION AND ESTIMATED PRODUCTION OF LIVESTOCK FORAGE a/

Action	Number	AUMs Produced
Brush Control (west of Pecos R.)	47,372 ac.	7,315
Burns	650 ac.	143
Range Improvements		823
Barbed wire fence	15.5 mi.	
Net wire fence	17.5 mi.	
Water developments	38.0 ea.	
Water pipeline	32.5 mi.	
	TOTAL	8,281

Source: RRA Inventory Files.
a/ See Appendix C-1

IMPACTS OF THE IPA ON

VEGETATION

Following implementation of the prescribed actions, forage production would increase approximately 4 percent over the amount required to sustain the existing 5-year-average-licensed-use. Improved species composition and increased density of the vegetation resulting from treatments would increase percent cover as shown in Table 3-21.

TABLE 3-21
(IPA) PERCENT COVER BY RANGE CATEGORY

Range Category	Percent Cover Existing	IPA
Loamy	60	65
Loamy/Gyp Uplands	52	52
Loamy/Hills	65	65
Limestone Hills	40	43
Malpais	34	34
Sandy	55	65

Source: RRA Inventory Files

Increased forage production, improved species composition, and increased cover would cause a shift in acres between ecological condition classes. Without the benefit of proper grazing management, improvement would be slight. A small amount of acreage in the poor and fair classes would move upward into an improved class. Acres already in good or excellent condition are not anticipated to change in class. Projected changes in ecological condition classes are shown in Table 3-22; Table 3-23 displays the predicted long term changes by range category.

TABLE 3-22
(IPA) LONG-TERM ECOLOGICAL CONDITION CLASSES

Existing (ac)	Ecological Condition Class	with IPA (ac)
93,666	Undetermined ("C")	93,666
25,332	Excellent	25,332
510,108	Good	552,150
270,093	High Fair	248,715
70,710	Fair	65,558
23,502	Poor	7,990

Source: RRA Inventory Files

TABLE 3-23

(IPA) ECOLOGICAL CONDITION BY RANGE CATEGORY

(FEDERAL ACRES)

Ecological Condition Class		Range Category											
		Loamy	Percent	Loamy/Gyp Uplands	Percent	Loamy Hills	Percent	Limestone Hills	Percent	Malpais	Percent	Sandy	Percent
Excellent		4,160	.4	0	0	0	0	19,892	2.0	0	0	1,280	.1
Good		111,028	11.2	9,124	.9	17,800	1.8	367,418	37.0	8 ,393	.8	38,387	3.9
Fair													
High-Fair	+38	66,482	6.7	6,227	.6	8,200	.8	151,351	15.2	0	0	16,455	1.7
Low-fair	-38	18,546	1.9	0	0	0	0	35,446	3.6	0	0	11,566	1.2
Poor		479	.1	0	0	0	0	6,073	.6	0	0	1,438	.1
Undetermined	a/	93,666	9.4										
TOTAL		294,361	29.7	15,351	1.5	26,000	2.6	580,180	58.4	8,393	.8	69,126	7.0

Source: BLM RRA Inventory Files, 1982-1983.

a/ "C" Category allotments.

The following is a description of the impacts on vegetation which would occur from the vegetation treatments and range improvements prescribed in this alternative. Table 3-24 displays the acres in each range category proposed for brush control treatments.

TABLE 3-24
(IPA) ACRES TO BE TREATED BY RANGE CATEGORY

	Range Category		
Brush Species	Loamy	Limestone Hills	Sandy
Mesquite	1,785 ac.		20,065
Cholla	14,410		
Creosote		1,970	
Snakeweed		8,142	

Source: BLM RRA Inventory Files, 1981-1982.

CHEMICAL BRUSH CONTROL

Under the IPA, 1,970 acres of creosote, 20,065 acres of mesquite, and 8,142 acres of snakeweed would be treated with herbicides (Appendix C-1). The treatments should kill at least 40 percent of these brush species. Desirable forage species would increase, with grass production remaining higher than levels prior to treatment for 7 to 30 years. Changes in plant composition would occur within 1 to 3 years following application.

The four herbicides proposed for use are dicamba, picloram, 2,4,5-T and tebuthiuron. A tank mix of picloram and dicamba, and a mixture of 2,4,5-T and picloram are also proposed. Refer to the DPA alternative for a more through discussion on the individual herbicides proposed for use.

MECHANICAL BRUSH CONTROL

Approximately 1,800 acres of mesquite and 14,000 acres of cholla cactus are proposed for grubbing. Grubbing would kill 80 to 95 percent of the target species, along with most of the grasses and forbs in the treatment area (Rechenthin, et. al. 1964). A 5 to 20 percent brush regrowth rate would be expected. Herbage response following grubbing would depend on precipitation received after treatment. Forage production may not recover for many years if drought conditions begin after treatment (Brock, et. al. 1978).

PRESCRIBED BURNING

Prescribed burns are proposed on 650 acres of alkali sacaton or giant sacaton (Appendix C-1). Burning would kill 50 percent of small mesquite plants and 10 percent of the mature mesquite plants growing in association with the sacaton (Glendening and Paulsen 1955; Reynolds and Bohnin 1956). Cholla and pricklypear mortality would be about 85 percent (Wright 1974).

Burning sacaton swales during wet years would double production; in a dry year, burning would decrease production by a third (Wright 1972). Due to the reduction of course, unpalatable growth, utilization of these swales would be increased for 6 months to 1 year (Heirman and Wright 1973; Klett, et. al. 1971).

RANGE IMPROVEMENTS

Approximately 17.5 miles of net wire fence and 15.5 miles of barbed wire fence would be constructed. New net wire fences would be authorized only in areas currently enclosed by and cross-fenced with net wire (non-antelope use areas). In big game use areas, fencing would meet BLM specifications for wildlife. Thirty eight (38) water facilities would be installed along with 32.5 miles of water pipeline. Disturbance to the vegetation from construction of these improvements would be minimal. In the long term, approximately one acre of vegetation would be sacrificed around each new water facility.

GRAZING SYSTEMS

No new grazing management plans would be developed. Established systems on existing AMPs would continue. The absence of grazing systems in areas where vegetation treatments are completed could shorten the longevity of the benefits of the project. Without proper management following vegetation treatments, target species would encroach more rapidly. Maximum benefits of range improvements and vegetation treatments would not be realized without some kind of proper grazing management being applied.

IMPACTS OF THE IPA ON
LIVESTOCK GRAZING

CHEMICAL BRUSH CONTROL

Livestock deferment for two consecutive growing seasons on treated pastures is required after chemical treatment. A decrease in livestock numbers may be necessary during this deferment period, if the remainder of the allotment cannot support the livestock that normally utilize the treated pastures.

MECHANICAL BRUSH CONTROL

A deferment of livestock grazing for two consecutive growing seasons is required after grubbing to aid in the recovery of vigor of desirable plants. Livestock forage from these pastures would be unavailable during the deferment period. Livestock numbers may need to be adjusted to the capacity of the remaining pastures on the allotment.

PRESCRIBED BURNING

Following burning, large amounts of palatable forage would be expected to become available. Livestock numbers may be increased for a time in order to utilize this forage before it again becomes unpalatable. Prescribed burns would reduce wildfire hazard, which could be injurious to livestock.

RANGE IMPROVEMENTS

Range fencing and water developments facilitate the handling of and caring for livestock, including enhanced breeding operations, greater ease in regulating stocking rates, separating animals by kind, sex, age or stage of reproduction, and controlling straying and trespassing of livestock. Water developments would facilitate handling of and caring for range animals (Valentine 1979), and would lessen the distance livestock have to travel between forage and water, resulting in better livestock distribution within a pasture. Improved distribution would improve utilization of the available forage resulting in increased livestock production.

IMPACTS OF THE IPA ON

SOILS/WATERSHED

Increases in vegetation production and ground cover resulting from the rangeland improvements and vegetation treatments (Table 3-20) would cause long-term improvement to the watershed. Surface runoff would not change on Loamy/Gyp Upland, Loamy/Hills, Malpais, Sandy, and Limestone Hills range sites, but would decrease 9 percent on Loamy range sites. Sediment yield would correspondingly decrease from the current .40 ac.ft./sq.mi./yr. to .35 ac.ft./sq.mi./yr. For more detail on the impacts to the watershed from rangeland improvements and vegetation treatments, refer to the DPA, page 3-17.

Increased percent cover (Table 3-21) and vegetation production would improve erosion classes in the long term as displayed in Table 3-25.

TABLE 3-25
(IPA) LONG-TERM CHANGE IN EROSION CLASSES

Existing (ac)	Class	with IPA (ac)
59,605	Stable	60,605
784,795	Slight	786,795
129,143	Moderate	130,143
19,868	Critical	15,868

Source: RDO Watershed Files.

Water consumption by livestock (excluding evaporation loss) is expected to increase in the long term to 236,900 gallons per day, on the average. The increased use would be much less than 1 percent of all consumptive water use in the planning area and would not present any significant problems to existing water supplies. Water quality would improve due to a decrease in runoff and sediment yields.

IMPACTS OF THE IPA ON

WILDLIFE

SPECIAL HABITAT FEATURES

The 1,650 acres of riparian SHFs would remain in existing condition or deteriorate as no specific measures would be undertaken to improve or protect them from livestock grazing. Possible adverse effects from brush control would be mitigated by application of the standard operating procedures listed in Chapter 1.

BIG GAME

Desert Mule Deer. Current estimates of habitat condition provided by the NMDG&F, along with the rangeland inventory data, indicate 95 percent of the mule deer habitat is in fair to good condition and in a stable trend. Continued livestock grazing at the proposed stocking rate is not expected to adversely impact mule deer. Impacts to mule deer would occur from brush control and the development of rangeland improvements. As previously stated in the DPA, large scale brush control could seriously affect local deer populations by removal of food and cover. When accomplished with proper mitigation measures, however, the brush control is predicted to improve the quality of mule deer habitat. Implementation of vegetation treatments and water developments is anticipated to improve the habitat to support approximately 2,050 desert mule deer (an increase of 248).

Pronghorn Antelope. Continued livestock grazing at the proposed stocking rate would not adversely impact pronghorn. The development of additional water facilities and the proposed brush control would benefit pronghorn in the long term by improving water distribution and increasing forb availability. It is estimated that an additional 30 antelope could be supported under this alternative (for a total of 415). Total demand for big game AUMs (deer and antelope) would be 2,942 AUMs, out of the 4,489 AUMs currently reserved for wildlife.

GAME BIRDS

Mourning Dove. Mourning dove would not be impacted by continued livestock grazing. They would benefit from the increased food source of large-seeded-forbs and grasses resulting from the 47,000 acres of vegetation control. Removal of brush on these acres would not seriously affect dove nesting habitat, as rangeland brush is not used extensively for nesting because it is too short (Lamb and Pieper 1971). Improved water distribution from the 38 new water facilities would enhance dove habitat.

Scaled Quail. Continued livestock grazing at the proposed level would not impact scaled quail habitat. Total control of brush species especially mesquite and cholla, would be detrimental to quail because of the loss of 47,000 acres escape/resting cover (Sawyer 1973). Leaving the control area interspersed with cholla and/or mesquite would help maintain quail numbers. Snakeweed has been shown to be an important quail food in southeastern New Mexico (Davis and Banks 1973), however, scaled quail easily adapt to changing food conditions because they are opportunistic feeders (Howard 1981). Increased densities of other large-seeded forbs and grasses would benefit them. Snakeweed control on 8,000 acres therefore, would have little detrimental effect on quail.

IMPACTS OF THE IPA ON

THREATENED AND ENDANGERED PLANTS AND ANIMALS

The Guadalupe milkvetch may be affected by continued livestock grazing, however, the extent of the impact is not known at this time. Brush control, which would convert shrublands to grasslands, would improve habitat conditions for Baird's sparrow and McCown's longspur. Davis cholla and zephyr lilies could be adversely affected by brush control and would require mitigation to preserve occupied habitat. Any action which could adversely affect a T/E species would require site-specific mitigation to avoid a "may effect" determination.

IMPACTS OF THE IPA ON

AIR QUALITY

Air quality would deteriorate locally during vegetation treatments and construction of range improvements (refer to the DPA for more detail). In the long term, air quality would not be enhanced in the treated areas.

IMPACTS OF THE IPA ON

CULTURAL RESOURCES

Standard operating procedures for cultural resources would limit adverse impacts on cultural resources. Herbicides and the associated diesel carriers have the potential of contaminating material which would be useful in radiocarbon dating by adding modern carbon to the material. This contamination would result in an inaccurate date. In the event of sample contamination, most radiocarbon laboratories anticipate the inert carbon could be removed if they knew in advance that the sample was contaminated (Las Cruces/Lordsburg EIS, 1983).

Although a cultural resource survey would be required prior to undertaking mechanical brush control (grubbing), more potential for conflict exists between this type of brush control and cultural resources, especially within 1500 feet of a live stream. The presence of cultural sites could limit where grubbing could occur.

Little to no direct impacts on cultural resource sites from burns would be anticipated since burns would be limited to draws (drainages). Along the edges of the draws, high probability of site occurrence exists. In these areas, the potential for impact from fire equipment exists. This is the area in which a minimum of a reconnaissance survey should be conducted.

Potential adverse impacts occur from rangeland construction activities such as fence building, and also from the maintenance and use of fences (i.e. two-track ways along fences, cattle drifting along fences). The impacts from livestock waterings are much larger than the area occupied by the facility itself due to intensive livestock use around the waters. For more detail on the impacts on cultural resources, refer to the DPA, beginning on page 3-24.

Continuation of livestock grazing at the proposed level would not create any additional impacts.

IMPACTS OF THE IPA ON

RECREATION

Recreational opportunities, in the form of hunting, would increase as the number of mule deer and pronghorn antelope increase on improved habitat. Table 3-26 displays the changes in visitor hours which would be expected to result from the IPA, in the long term.

TABLE 3-26
(IPA) HUNTING/RECREATION VISITATION

Activity	Existing Situation	with IPA
Hunting		
Deer		
Visitor Hours	52,536	59,735
Pronghorn Antelope		
Visitor Hours	2,620	2,824
Total	55,156	62,559

Source: RRA Wildlife files; NMDG&F

The IPA makes no recommendations to mitigate continued livestock use which impacts unique cave resources. Indirect benefit to cave resources from the prescribed brush control would be accrued as runoff and siltation decrease and infiltration increases.

IMPACTS OF THE IPA ON

VISUAL RESOURCES

Large-scale chemical or mechanical treatments would cause a direct impact to visual resources since the color, form, and line of the landscape would be substantially different from adjacent untreated areas. Impacts on visual resources from prescribed burns would be short-lived and would not significantly alter the landscape in the long term.

The degree of visual impact from range improvements or vegetation modification would be determined through a site-specific EA prior to implementation. Visual contrasts are expected to be minimized to a degree that is compatible with the VRM class of the area.

IMPACTS OF THE IPA ON

SOCIOECONOMIC CONDITIONS

The short term affects of the IPA are the same as those for the DPA (see Table 3-15).

PRIMARY IMPACTS

As the long-term increases in the authorized stocking rates occur, herd sizes would increase and would vary between ranch categories as follows:

Small commercial cow-calf ranch	6.7
Medium commercial cow-calf ranch	1.3
Large commercial cow-calf ranch	5.1
Medium commercial sheep/cow-calf ranch	0.7
Large commercial sheep/cow-calf ranch	0.7

Increase in authorized use would move 1 medium cow-calf operation to the large category. Increased herd sizes would increase ranch values, up $651,000, and increased rancher income, up $212,346. Table 3-27 compares the long-term impacts on rancher income of the IPA to those of the PA.

TABLE 3-27
(IPA) LONG-TERM ESTIMATED RECEIPTS, COSTS, AND RETURNS FOR ALL RANCH SIZE CATEGORIES IN THE ROSWELL RESOURCE AREA

Item	PA	IPA	Percent Change from PA
No. of Operators	76	76	
Gross Income	$6,031,975	$6,244,321	+ 3.5
Total Cash Costs	3,263,288	3.431.533	+ 5.1
Returns above:			
Cash Cost	2,768,687	2,812,788	+ 1.5
Depreciation	1,314,543	1,314,543	NC
Returns to Operator Labor, Management, and Capital	1,454,144	1,498,245	+ 3.0
Total AUs a/	32,432	32,974	+ 1.6

Source: BLM RRA EIS files

a/ Includes Federal, State, and private AUs.

See Appendix I TABLE I-4, I-8, I-12, I-16, and I-20 for estimated costs and returns for individual ranch size categories.

SECONDARY IMPACTS

The secondary impacts of this alternative, on those employed by the rancher and in the related livestock sector, are shown in Table 3-28.

TABLE 3-28
(IPA) CHANGES IN EMPLOYMENT AND PERSONAL INCOME

	BLM Livestock Industry		Related Livestock Industry		Total	
	Jobs	Income	Jobs	Income	Jobs	Income
Short term loss	- 4	-$ 10,700	- 3	-$ 35,000	- 7	-$ 45,700
Short term gain a/	27	503,000	15	377,000	42	960,794
Long term gain	6	64,400	6	19,800	12	84,200

Source: BLM RRA Input/Output (I/O Files

a/ Gains in employment and personal income are short term and are generated by the expenditure of approximately 1.0 million dollars for range improvements.

The IPA would increase the revenue and income from recreational uses of the public lands by approximately $70,000 (Table 3-29). The increased revenue would be generated from increases in the numbers of mule deer and pronghorn antelope.

TABLE 3-29
COMPARISON OF REVENUES AND INCOME FROM RECREATION
BETWEEN PA AND IPA
(dollars/year)

Activity	PA	IPA
General Recreation	$330,193	$330,193
Hunting:		
Upland Game a/	33,200	33,200
Deer	373,531	441,644
Pronghorn Antelope	22,349	24,089
TOTAL	$759,273	$829,126

Source: RRA Wildlife Files, Sage Ram, NMDG&F
a/ Mourning Dove, Scaled Quail

ELIMINATION OF LIVESTOCK GRAZING (ELG)

Under the ELG, all AUMs allocated for livestock use would be discontinued regardless of allotment category. In the short term, approximately 14,700 Animal Units (AUs) would have to be sold or pastured on privately owned or leased lands. In the long term, all remaining livestock, approximately 4,300 AUs, would be sold or otherwise. Short and long term estimated stocking rates are shown in Table 3-30:

TABLE 3-30
(ELG) ESTIMATED SHORT AND LONG-TERM STOCKING RATES

	Livestock AUMs	Percent Change from Existing Situation
Existing	228,656	0
Short Term	51,924	-78
Long Term	0	-100

Source: RRA Inventory Files

IMPACTS OF THE ELG ON

VEGETATION

Vegetation response to no grazing would vary according to range site, condition class and climatic conditions. Eliminating grazing pressure from livestock would allow plants to regain vigor and would increase forage production in the short term by an estimated 4 percent over requirements to sustain existing 5-year-average-licensed-use. An overall increase in the density of vegetation would occur (Blydenstein, et. al. 1957), followed by a subsequent increase in vegetational litter. In the long term, forage production would decline slightly to approximately 2 percent over the current requirements (for existing licensed use) as litter builds up and vegetation becomes decadent. Increased litter would indirectly benefit vegetation by slowing runoff and holding moisture on the ground for a longer period. A negative effect of increased density and litter would occur in the event of unsuppressed rangeland fires. Fires would have more fuel to burn and would burn hotter, causing greater initial damage to plants (Hopkins, et. al. 1948; Wright 1971). As a result, fire tolerant species would constitute a larger percentage of the species composition. Rangeland fires would help control snakeweed, cactus, and other undesirable brush species. Estimated changes in percent cover (vegetation density and litter) by range category are shown in Table 3-31.

TABLE 3-31
(ELG) PERCENT COVER BY RANGE CATEGORY

Range Category	Percent Cover Existing	ELG
Loamy	60	65
Loamy/Gyp Uplands	52	55
Loamy/Hills	65	68
Limestone Hills	40	43
Malpais	34	34
Sandy	55	60

Source: RRA Inventory Files

Increased forage production and cover would improve the ecological condition of the range in the long term. Much of the acreage currently in fair condition would improve to good condition, dependent on the range site and climatic conditions. Acres in excellent and good condition are not expected to exhibit any measurable change. Acres in poor condition are not expected to improve without any external manipulations (such as brush control). Estimated changes in ecological condition classes are shown in Table 3-32.

Proper grazing can be beneficial as it stimulates plant growth in many cases (Stoddard et al. 1975). By excluding livestock grazing, the beneficial affects would not be realized. Some of the effects of proper livestock grazing are: loosening of soil surface during dry periods; incorporation of mulch into the soil profile to speed humus development; nutrient recycling and increased availability in the ecosystem; trampling of seeds into the soil; reduction of excess accumulation of standing dead vegetative material which chemically and physically inhibits new growth; and reduction of fire, insect, and rodent problems associated with vegetation accumulation (Holechek 1981). Estimated changes in acres for each ecological condition class by range category are displayed in Table 3-33.

IMPACTS OF THE ELG ON

LIVESTOCK GRAZING

Under this alternative, all livestock would be removed from public land in the EIS area. Grazing preference of 249,535 AUMs would be

TABLE 3-32
(ELG) LONG-TERM ECOLOGICAL CONDITION CLASSES

Existing (ac.)	Ecological Condition Class	with ELG (ac.)
93,666	Undetermined ("C")	93,666
25,332	Excellent	25,332
510,108	Good	780,201
270,093	High Fair	45,210
70,710	Low Fair	25,500
23,502	Poor	23,502

Source: RRA Inventory Files

TABLE 3-33
(ELG) ECOLOGICAL CONDITION BY RANGE CATEGORY
(FEDERAL ACRES)

Ecological Condition Class	Range Category											
	Loamy	Percent	Loamy/Gyp Uplands	Percent	Loamy Hills	Percent	Limestone Hills	Percent	Malpais	Percent	Sandy	Percent
Excellent	4,160	.4	0	0	0	0	19,892	2.0	0	0	1,280	.1
Good	174,897	17.6	14,292	1.4	24,606	2.5	502,521	50.6	8,393	.8	55,492	5.6
Fair												
High-Fair +38	12,555	1.3	1,059	.1	1,394	.1	26,749	2.7	0	0	3,452	.4
Low-fair -38	7,603	.8	0	0	0	0	13,275	1.3	0	0	4,622	.5
Poor	1,480	.2	0	0	0	0	17,742	1.8	0	0	4,280	.4
Undetermined a/	93,666	9.4	0	0	0	0	0	0	0	0	0	0
TOTAL	294,361	29.7	15,351	1.5	26,000	2.6	580,180	58.4	8,393	.8	69,126	7.0

Source: BLM RRA Inventory Files, 1982-1983.

a/ "C" Category allotments.

suspended as permits and leases expire on all 284 allotments. New rangeland developments would not be constructed for livestock use, and existing rangeland developments would be removed, abandoned, or maintained for other resources. Many livestock operators would be forced to liquidate, disperse thier livestock, or obtain other lands for grazing to remain in business. Livestock operators would also have to manage private and State lands in such a way as to prevent trespass on public lands. All vegetation produced on public lands would be available for other resource use.

IMPACTS OF THE ELG ON

SOILS/WATERSHED

Under the ELG alternative, all livestock would be removed from the public land, therefore, soil disturbance resulting from livestock grazing would be eliminated. Soil erosion by wind and water would decrease slightly on areas where vegetational ground cover increases. Brush infested areas would continue to deteriorate without vegetation treatments. Increased ground cover would reduce sediment yield from the current .40 ac.ft./sq.mi./yr. to approximately .30 ac.ft./sq.mi./yr.

Surface runoff would not change in the Loamy/Gyp Upland, Limestone Hills, Sandy and Malpais range sites. Runoff would decrease approximately 9 percent on Loamy and 37 percent on Loamy/Hills range sites.

Elimination of livestock grazing would improve erosion classes in the long term as shown below in Table 3-34

TABLE 3-34
(ELG) LONG-TERM CHANGE IN EROSION CLASSES

Class	Existing (ac)	with ELG (ac)
Stable	59,605	60,605
Slight	784,795	786,795
Moderate	129,143	130,143
Critical	19,868	15,868

Source: RDO Watershed Files

The elimination of all livestock consumptive use (excluding evaporation loss) would provide approximately 256 acre feet of water annually for other uses and would amount to less than a 1 percent increase in availability. Water quality would improve due to a decrease in runoff and sediment yields.

IMPACTS OF THE ELG ON

WILDLIFE

SPECIAL HABITAT FEATURES

The 1,650 acres of riparian habitat would benefit from the elimination of livestock grazing, particularly the 250 acres of cottonwood trees. Without grazing pressure, cottonwood seedlings would increase in number and vigor, providing more food and cover for wildlife.

BIG GAME

Desert Mule Deer. Removal of livestock grazing would improve deer habitat, especially in brushy drainages which receive heavy seasonal use by livestock. Approximately 300,000 acres in low fair and high fair condition would move upward into an improved ecological condition class (see Table 3-32), which would generally benefit mule deer. Livestock waters that are beneficial to wildlife would have to be maintained by alternate means (BLM manpower and funding) to maintain deer dependent on them. Approximately 75 percent of existing water sources are located on private and State lands, and would probably be fenced off by the landowner to avoid trespass onto public lands. Of 1692 miles of existing fence, 1292 miles that currently prohibit or restrict big game movement (including pronghorn antelope) across public lands would be removed. Additional fencing, constructed by private land owners, which segregates public lands from State and private lands and water sources may complicate movement problems beyond existing levels and force big game (including pronghorn antelope) to obtain water elsewhere. In the long term, it is estimated that the habitat would support an additional 626 mule deer (for a total of 2,435).

Pronghorn Antelope. Improvement of pronghorn antelope habitat would occur from decreased forb competition, particularly with sheep, and from the removal of restrictive fencing on public land. The construction of new fences to segregate private and State lands from Federal lands could produce new restrictions. In the long term, it is estimated that pronghorn numbers would increase from 385 to 512 animals.

Total demand for big game AUMs (deer and antelope) would be 3,500 AUMs.

GAME BIRDS

Mourning Dove. In general, the increased availability of grass and forb seed heads that would result from improved ecological condition would benefit mourning dove. No adverse impacts would be expected to occur.

Scaled Quail. The improvement in ecological range condition would benefit quail as additional seed-producing forbs and grasses would be available. Quail numbers would not be expected to change appreciably as a result of livestock removal alone.

IMPACTS OF THE ELG ON

THREATENED AND ENDANGERED PLANTS ANIMALS

No adverse impacts would occur to threatened or endangered species. The improved ecological condition would generally benefit threatened or endangered species, particularly those plants impacted by livestock grazing, such as the Guadalupe milkvetch.

IMPACTS OF THE ELG ON

AIR QUALITY

With the ELG alternative, air quality would be slightly enhanced due to increased ground cover and forage production which would result from the removal of livestock grazing.

IMPACTS OF THE ELG ON

CULTURAL RESOURCES

The removal of livestock from public land would eliminate the potential for livestock trampling of artifacts and sites. The removal of rangeland improvements would cause some new surface soil disturbance and the loss of some potential historical structures.

IMPACTS OF THE ELG ON

RECREATION

This alternative would improve recreation opportunities, in the long term, by eliminating the impact of grazing on the environment. With no grazing, more forage would be available for wildlife, which would improve hunting opportunities. The estimated increase in deer and pronghorn antelope numbers would draw more hunters to the area.

Estimated increases generated in recreational hunting are shown in Table 3-35.

TABLE 3-35
(ELG) HUNTING/RECREATION VISITATION

Activity	Existing Situation	with ELG
Hunting		
Deer		
Visitor Hours	52,536	70,712
Antelope		
Visitor Hours	2,620	3,484
TOTAL	55,156	74,196

Source: RRA Wildlife Files, NMDG&F

A negative impact on recreation opportunities could be created due to the potential lack of upkeep on operator-maintained access roads. Without the maintenance provided by the ranch operator, these roads could deteriorate to a point where they are no longer useable.

Cave resources would benefit under the ELG alternative. More forage would remain on the surface improving ground water percolation into caves, and siltation would be retarded.

IMPACTS OF THE ELG ON

VISUAL RESOURCES

Livestock exclusion would have a significant effect on visual resources. Exclusion of livestock grazing from an area would result in its vegetation approaching optimum density and maximum growth, dependent on climatic conditions. This would be in strong contrast to vegetation being grazed adjacent to the exclusion area. The adverse impact, from a visual standpoint, of range improvements would also be lessened. Generally speaking, the public land would take on a more pristine appearance.

IMPACTS OF THE ELG ON

SOCIOECONOMIC CONDITIONS

The elimination of livestock grazing from the public lands would have adverse impacts on the ranch operator in both the short term and long term. Adjustments in total herd size by ranch category would be as follows:

	Short Term	Long Term	Total Adjustment
Small commercial cow-calf	-57.6%	-21.16%	-79.2%
Medium commercial cow-calf	-31.2%	-12.5%	-43.7%
Large commercial cow-calf	-25.7%	-32.3%	-58.0%
Medium commercial sheep/cow-calf	-52.5%	-10.8%	-63.3%
Large commercial sheep/cow-calf	-36.7%	- 1.9%	-38.6%

These large reductions in herd size would have the following impacts in the ranch size categories: 2 small cow-calf operations would be eliminated; 4 medium cow-calf, 1 large cow-calf, 11 medium sheep/cow-calf, and 3 large sheep/cow-calf operations would become non-self-sufficient (less than 275 AUs). Changes in rancher income are shown in Table 3-36.

TABLE 3-36

(ELG) SHORT AND LONG-TERM ESTIMATED RECEIPTS, COSTS AND RETURNS FOR ALL RANCH SIZE CATEGORIES IN THE ROSWELL RESOURCE AREA

Items	PA No Action	% Change from PA	ELG Short Term	Total % Change	ELG Long Term
Gross Income	$6,031,975	-38.1	3,730,719	-47.8	$3,148,691
Total Cash Costs	3,263,288	-34.9	2,121,523	-50.0	1,631,644
Returns above Cash Costs	2,768,687	-41.8	1,609,196	-45.2	1,464,564
Depreciation	1,314,543	-0	1,314,543	0	1,314,543
Returns to Operator Labor, Management, and Capital	1,454,144	-79.7	294,653	-86.3	199,218
Total AUs a/	32,432	-38.1	20,043	-47.2	17,124

Source: BLM Roswell District EIS Files

a/ Includes Federal, State and Private AUs.

See Appendix I Tables I-3 through I-20 for estimated costs and returns for individual ranch size categories.

In the short term, ranch income would increase as the herd sizes are decreased. This increase would be shortlived and income would fall rapidly as production decreases. With the removal of approximately 47 percent of the herd from these ranches ranch values would decrease by 18.4 million dollars. This would impact the selling price of any ranch sold and would impair the ranchers ability to obtain loans.

Eliminating livestock grazing from public lands would produce measurable impact to the regional economy. Table 3-37 shows that 230 jobs and 1.2 million dollars of personal income would be lost.

TABLE 3-37

(ELG) CHANGES IN EMPLOYMENT AND PERSONAL INCOME

	BLM Livestock Industry		Related Livestock Industry		Total	
	Jobs	Income	Jobs	Income	Jobs	Income
Short-term loss	-74	$223,000	-121	$727,000	-195	$ 950,000
Long-term loss	-19	-57,000	-16	-186,000	-35	-243,000
Net Long-term loss	-93	-280,000	-137	-913,000	-230	-1,193,000

Source: BLM RRA Input/Output (I/O) Model

This alternative would increase revenues and income (Table 3-38) received from recreational use of the public lands by approximately $136,000 dollars. The increased income is caused by the elimination of grazing from the public lands allowing for increased habitat availability for wildlife and wildlife numbers.

TABLE 3-38

COMPARISON OF THE REVENUE AND INCOME FROM RECREATION BETWEEN PA AND ELG

(dollars/year)

Activity	PA	ELG
General Recreation	$330,193	$330,193
Hunting:		
Upland Game a/	33,200	33,200
Deer	373,531	502,762
Pronghorn Antelope	22,349	29,719
TOTAL	$759,273	$895,874

Source: RRA Wildlife Files, Sageram, NMFG&F

a/ Mourning Dove, Scaled Quail

MAXIMIZATION OF FORAGE FOR LIVESTOCK (MAX)

Under the MAX alternative, an intensive program of grazing management was designed to maximize forage production and livestock use. Rangeland improvements, vegetation treatments, and grazing systems would be developed to correct unsatisfactory resource conditions and increase allowable utilization of forage species. These actions would take place on "M" and "I" category allotments in the order ranked by a benefit/cost analysis of each action.

Target stocking rates have been estimated based on predicted results which would occur from implementation of the management prescription for the MAX alternative. Table 3-39 displays the estimated short and long-term stocking rates.

TABLE 3-39
(MAX) ESTIMATED SHORT AND LONG-TERM STOCKING RATES

	Livestock AUMs	Percent Change from Existing Situation
Existing Licensed Use	228,656	0
Short Term	220,871	- 5
Long Term	296,061	+ 28

Source: RRA Inventory Files

The short-term adjustment of 7,785 AUMs is a 5 percent decrease from the 5-year-average-licensed use and reflects temporary deferments which follow vegetation treatment projects. This adjustment is a reduction of approximately 650 Animal Units (AUs) from "M" and "I" category allotments. These AUs would have to be sold or pastured on other lands owned or leased by the permittee. Long-term stocking rates (approximately 5,600 AUs over 5-year-average-licensed-use) reflect the additional forage produced through the prescribed actions and the increased utilization of forage (Table 3-40).

TABLE 3-40
(MAX) MANAGEMENT PRESCRIPTION AND ESTIMATED PRODUCTION OF LIVESTOCK FORAGE a/

Action	Number	AUMs Produced
Brush Control	49,392 ac	7,786
Burns	1,880 ac	414
Range Improvements		1,639
Barbed-wire fence	17.5 mi	
Net-wire fence	29.5 mi	
Water developments	80.0 ea	
Water pipeline	69.1 mi	
Grazing Systems/ Increased Utilization	899,745 ac	57,566
TOTAL		67,405

Source: RRA Inventory Files
a/ See Appendix C-2

IMPACTS OF THE MAX ON

VEGETATION

Improved species composition and increased density following vegetation treatments and grazing management would increase forage production approximately 8 percent in the short term. Over an extended period (15-20 years), increased grazing pressure would cause production to stabilize or decline by 1 percent. A slight increase in percent cover would occur on treated sites, however, percent cover would decrease on other sites due to their susceptibility to grazing pressure (Table 3-41).

TABLE 3-41
(MAX) PERCENT COVER BY RANGE CATEGORY

Range Category	Percent Cover Existing	MAX
Loamy	60	63
Loamy/Gyp Uplands	52	50
Loamy Hills	65	62
Limestone Hills	40	42
Malpais	34	34
Sandy	55	63

Source: RRA Inventory Files

The implementation of vegetation treatments, and to some extent grazing systems, would shift some acres currently in the poor and low fair ecological condition classes to an improved class. Increased grazing pressure on the acres in excellent and good condition would cause them to decline into a poorer class as shown in Table 3-42. Table 3-43 displays the projected long-term ecological condition class by range category.

TABLE 3-42
(MAX) LONG-TERM ECOLOGICAL CONDITION CLASSES

Existing (ac)	Ecological Condition Class	with MAX (ac)
93,666	Undetermined ("C")	93,666
25,332	Excellent	20,262
510,108	Good	408,086
270,093	High Fair	447,895
70,710	Low Fair	18,798
23,502	Poor	4,704

Source: RRA Inventory Files

The impacts on vegetation which would occur from brush control, prescribed burning, development of range improvements, implementation of grazing systems, and increased utilization are discussed in the following narrative. Table 3-44 displays the acres in each range category proposed for brush control treatments.

TABLE 3-43
(MAX) ECOLOGICAL CONDITION BY RANGE CATEGORY
(FEDERAL ACRES)

Ecological Condition Class	Range Category Loamy	Percent	Loamy/Gyp Uplands	Percent	Loamy Hills	Percent	Limestone Hills	Percent	Malpais	Percent	Sandy	Percent
Excellent	4,160	.4	0	0	0	0	19,892	2.0	0	0	1,280	.1
Good	173,413	17.5	14,186	1.4	24,467	2.5	499,471	50.3	8 ,393	.8	55,009	5.5
Fair												
High-Fair +38	13,204	1.3	1,165	.1	1,533	.2	28,223	2.8	0	0	3,797	.4
Low-fair -38	8,438	.9	0	0	0	0	14,852	1.5	0	0	4,760	.5
Poor	1,480	.2	0	0	0	0	17,742	1.8	0	0	4,280	.4
Undetermined a/	93,666	9.4	0	0	0	0	0	0	0	0	0	
TOTAL	294,361	29.7	15,351	1.5	26,000	2.7	580,180	58.4	8,393	.8	69,126	6.9

Source: BLM RRA Inventory Files, 1982-1983.
a/ "C" Category allotments.

TABLE 3-44
(MAX)ACRES TO BE TREATED BY RANGE CATEGORY

Brush Species	Range Category Loamy	Limestone Hills	Sandy
Mesquite	1,785		21,545
Cholla	15,870		
Creosote		2,050	
Snakeweed		8,142	

Source: BLM RRA Inventory Files.

CHEMICAL BRUSH CONTROL

Under the MAX alternative, approximately 2,000 acres of creosote, 22,000 acres of mesquite, and 8,100 acres of snakeweed would be treated with herbicides (Appendix C-2). At least 40 percent of the target species would be killed on treated areas. Subsequent grass production would remain at higher levels than pre-treatment for 7 to 30 years.

The herbicides proposed for use are dicamba, picloram, 2,4,5-T, and tebuthiuron. A tank mix of picloram and dicamba, and a mixture of 2,4,5-T and picloram are also proposed. The impacts from the use of these herbicides is discussed in more detail in the DPA beginning on page 3-12 .

MECHANICAL BRUSH CONTROL

Approximately 1,800 acres of mesquite and 15,870 acres of cholla would be mechanically treated under this alternative. Grubbing (or plowing) would kill 80 to 95 percent of the target species, along with most of the grasses and forbs in the treatment area (Rechenthin et. al. 1964). A 5 to 20 percent brush regrowth rate would be expected. Response of grasses and forbs would depend largely on precipitation. For more detail on mechanical brush control, refer to the DPA, page 3-14 .

PRESCRIBED BURNING

Approximately 1,900 acres of alkali or giant sacaton are proposed for prescribed burning. Due to the reduction of coarse, unpalatable growth, use of sacaton swales would be increased for 6 months to 1 year (Hierman and Wright 1973; Klett et.al. 1971). Some mequite, prickly pear, and cholla growing in association with the sacaton would be killed Refer to the DPA alternative for more detail on prescribed burning, page 3-15 .

RANGE IMPROVEMENTS

Approximately 30 miles of net-wire fence would be constructed in non-antelope-use areas. Approximately 18 miles of barbed-wire fence would be constructed, and would conform to BLM fencing specifications in big game use areas. Eighty (80) new livestock watering facilities would be developed, along with 69 miles of water pipeline.

GRAZING SYSTEMS

Under the MAX alternative, grazing systems would be designed on approximately 900,000 acres to provide periodic rest periods during critical seasons for desirable forage plants. The allowable utilization level would be increased by approximately 10 percent providing forage for additional livestock which is normally reserved for wildlife and watershed. In the short term, this would not seriously affect vegetation; in the long term, some of the benefits from vegetation treatments and range improvements would be lost from the increased grazing pressure. Grazing systems would offset some of the increased use, but probably not all of it. Sacrifice areas around watering facilities, feeders, and saltings could be enlarged.

IMPACTS OF THE MAX ON
LIVESTOCK GRAZING

CHEMICAL BRUSH CONTROL

Livestock deferment for two consecutive growing seasons on treated pastures is required after chemical treatment. A decrease in livestock numbers may be necessary during this deferment period, if the remainder of the allotment cannot support the livestock that normally utilize the treated pastures.

MECHANICAL BRUSH CONTROL

A deferment of two consecutive growing seasons is required after grubbing to aid in the recovery of vigor of desirable plants. Livestock numbers may need to be adjusted to the capacity of the remaining pastures on the allotment.

PRESCRIBED BURNING

Following burning, large amounts of palatable forage would be expected to become available. Livestock numbers may be increased for a time in order to utilize this forage before it again becomes unpalatable.

RANGE IMPROVEMENTS

Range fencing and water developments facilitate the handling of and caring for livestock. Fencing would aid in controlling straying and trespassing of livestock, and would enhance breeding operations. Water developments would lessen the distance livestock have to travel for forage and between waters, resulting in better livestock distribution within a pasture. Improved distribution would facilitate more even utilization of the available forage resulting in an increase in livestock production.

GRAZING SYSTEMS

Grazing systems which require less than one year's rest would normally not require a decrease in livestock numbers, because all available livestock forage would be accessible during various times of the year. Grazing systems requiring a one year or more rest may require a reduction in livestock numbers during the cycle's first year because forage in the pastures being rested would not be available.

IMPACTS OF THE MAX ON
SOILS/WATERSHED

Long-term surface runoff would increase 10 percent on the Loamy/Gyp Upland and 20 percent on Loamy/Hills range sites due to the decrease in vegetational ground cover. Runoff would decrease 9 percent on Loamy range sites as a result of increased vegetation in treated areas. No change would occur on the Sandy, Malpais, and Limestone Hills range sites. The increased ground cover in Loamy range sites would cause sediment yields to decrease from .40 ac.ft./sq.mi./yr. to approximately .30 ac.ft./sq.mi./yr overall. Erosion classes would be improved as shown in Table 3-45. Refer to the DPA, page 3-17, for more detail on impacts from rangeland improvements and vegetation treatments.

TABLE 3-45
(MAX) LONG-TERM CHANGE IN EROSION CLASSES

Classes	Existing (ac)	with MAX (ac)
Stable	59,605	61,605
Slight	784,795	787,795
Moderate	129,143	131,143
Critical	19,868	12,868

Source: RDO Watershed Files.

Water consumption by livestock (excluding evaporation loss) would increase from the present use of 228,700 gallons per day to 296,100 gallons per day. This increase use is less than 1 percent of all consumptive use in the planning area and would not present any significant problems to existing water supplies. Water quality would improve due to decreased runoff and sediment yields.

IMPACTS OF THE MAX ON
WILDLIFE

SPECIAL HABITAT FEATURES

Riparian habitat currently in good ecological condition would deteriorate to fair condition due to increased grazing pressure and utilization by livestock. Deteriorated condition would adversely affect the wildlife species which depend on this habitat type for food and nesting/resting cover.

BIG GAME

Desert Mule Deer. Improved water distribution from the 80 new water facilities would benefit mule deer, however, increased livestock grazing at the proposed stocking rate would adversely impact deer numbers in the long term. The higher level of forage utilization by livestock would cause approximately 5,000 acres currently in excellent ecological condition to decline to a lower condition class resulting in overall habitat deterioration. Browse and forb species preferred by mule deer would be used more extensively by livestock, decreasing the amount available for deer use. Range improvements and brush control, when implemented with the proper mitigation measures, would not create an adverse impact. Mule deer numbers in the long term, are predicted to decline to approximately 1,700 animals (a decrease of 100).

Pronghorn Antelope. Increased livestock numbers and heavier utilization of forage would create serious dietary conflicts between livestock and pronghorn antelope. An increased amount of forb species normally preferred by pronghorn would be used by both cattle and sheep.

Although brush control would convert more shrubland to grassland, which would be beneficial to pronghorn, the intense livestock grazing would likely void any benefit gained. It is estimated that the habitat would support approximately 240 pronghorn, a decrease of one third of the existing population on public land.

Total demand for big game AUMs (deer and antelope) would be 2,346 AUMs, out of the 4,489 AUMs currently reserved for wildlife.

GAME BIRDS

Mourning Dove. The development of 80 new water facilities along with the proposed vegetation treatments would enhance dove habitat in the short term. In the long term, declines in ecological condition, reduced cover, and reduced forage from increased grazing pressure would result in deteriorated habitat conditions. Dove numbers are variable depending on other factors, particularly rainfall, but numbers would be expected to be less than existing levels.

Scaled Quail. Removal of mesquite, cholla, and snakeweed through brush control would be detrimental to scaled quail. Increases in livestock numbers, however, could create new invasions of these brush species in areas where grazing management does not meet its objectives. Overall, scaled quail numbers, are expected to remain at, or slightly below, existing levels.

IMPACTS OF THE MAX ON
THREATENED AND ENDANGERED PLANTS AND ANIMALS

T/E species associated with the Pecos River and associated riparian habitat would not be affected by actions prescribed in the MAX alternative. Brush control could adversely affect plant species, specifically, Davis cholla and zephyr lilies. Baird's sparrow and McCown's longspur would be benefitted by brush control which would convert shrublands to grasslands. The Guadalupe milkvetch may be impacated by increased livestock grazing, however, the extent of impact is not known. Site-specific mitigation would be required prior to implementation of any action which would cause a "may affect" determination.

IMPACTS OF THE MAX ON
AIR QUALITY

Air quality would deteriorate locally during vegetation treatments and construction of range improvements (refer to the DPA for more detail). In the long term, air quality would be enhanced in the treated areas.

IMPACTS OF THE MAX ON

CULTURAL RESOURCES

Standard operating procedures for cultural resources should limit adverse impacts on cultural resources. The potential for adverse impacts to cultural resources is greatest under the MAX alternative due to the increased acreage to be treated, increased number of range improvements, and increased numbers of livestock (see Table 3-37).

Herbicides and the associated diesel carriers have the potential of contaminating material which would be useful in radiocarbon dating by adding modern carbon to the material. This contamination would result in an inaccurate date. In the event of sample contamination, most radiocarbon laboratories anticipate the inert carbon could be removed if they knew in advance that the sample was contaminated (Las Cruces/Lordsburg EIS, 1983).

Although a cultural resource survey would be required prior to undertaking mechanical brush control (grubbing), more potential for conflict exists between this type of brush control and cultural resources, especially within 1500 feet of a live stream. The presence of cultural sites could limit where grubbing could occur.

Little to no direct impacts on cultural resource sites from burns would be anticipated since burns would be limited to draws (drainages). Along the edges of the draws, high probability of site occurrence exists. In these areas, the potential for impact from fire equipment exists. This is the area in which a minimun of a reconnaissance survey should be conducted.

Potential adverse impacts occur from rangeland construction activities such as fence building, and also from the maintenance and use of fences (i.e. two-track ways along fences, cattle drifting along fences). The impacts from livestock waterings are much larger than the area occupied by the facility itself due to intensive livestock use around the waters. For more detail on the impacts on cultural resources, refer to the DPA, beginning on page 3-24.

IMPACTS OF THE MAX ON

RECREATION

The MAX alternative would adversely impact recreation resources. It is the only alternative in which recreation values generally decrease. The decrease is attributed to a decline in deer and antelope numbers which in turn reduces hunting opportunities, and the benefits produced by recreational hunting. Table 3-46 displays recreational hunting use under the MAX alternative.

TABLE 3-46
(MAX) HUNTING/RECREATION VISITATION

Activity	Existing Situation	with MAX
Hunting		
Deer		
Visitor Hours:	52,536	49,890
Pronghorn Antelope		
Visitor Hours:	2,620	1,633
Total	55,156	51,523

Source: RRA Wildlife Files, NMDG&F

Under this alternative, cave resources would be adversely impacted. Surface runoff is expected to increase approximately 10 percent in the Loamy/Gyp Uplands range site, an area of numerous caves and sinkholes. An increase in runoff corresponds to a decrease in infiltration, the natural process which is necessary in maintaining cave resources. Problems currently associated with livestock grazing and their impact on unique cave resources would not be mitigated under this alternative, and would likely increase in intensity.

IMPACTS OF THE MAX ON
VISUAL RESOURCES

Large-scale chemical or mechanical treatments would cause a direct impact to visual resources since the color, form, and line of the landscape would be substantially different from adjacent untreated areas. Impacts on visual resources from prescribed burns would be short-lived and would not significantly alter the landscape in the long term.

The degree of visual impact from range improvements or vegetation modification would be determined through a site-specific EA prior to implementation. Visual contrasts are expected to be minimized to a degree that is compatible with the VRM class of the area.

IMPACTS OF THE MAX ON
SOCIOECONOMIC CONDITIONS

Primary impacts of this alternative would be felt by the ranch operator. Secondary effects would be felt by those employed on the ranches and those employed in the related livestock sector.

PRIMARY IMPACTS

In the short term, total herd sizes would be reduced. Reductions would vary between the ranch size categories as follows:

Small commercial cow-calf ranch	-7.9%
Medium commercial cow-calf ranch	-3.0%
Large commercial cow-calf ranch	-5.0%
Medium commercial sheep/cow-calf ranch	-0.3%
Large commercial sheep/cow-calf ranch	-0.7%

These reductions would move 1 medium cow-calf operation to the small cow-calf category. Income to all ranches would increase as livestock sales increased to reduce herd size. This income would be short-lived and would rapidly fall due to decreased production. Most ranchers would probably continue to ranch, however, despite poor economic returns by increasing the efficiency of their operations through increased calving percentages, increased selling weights of livestock, by leasing more expensive private or State land, or by not making full allowance for depreciation. Table 3-47 compares the short term effects of the MAX alternative on operator income to that of the PA. Ranch values would decrease by approximately $727,000.

TABLE 3-47
(MAX) SHORT TERM ESTIMATED RECEIPTS, COSTS, AND RETURNS FOR ALL RANCH SIZE CATEGORIES IN THE ROSWELL RESOURCE AREA

Item	PA	MAX	Percent Change from PA
No. of Operators	76	76	
Gross Income	$6,031,975	$5,929,598	-1.6
Total Cash Costs	3,263,288	3,199,239	-1.9
Returns above Cash Cost	2,768,687	2,730,359	-1.3
Depreciation	1,314,543	1,314,543	0
Returns to Operator Labor, Management, and Capital	1,454,144	1,415,816	2.6
Total AUs a/	32,431.6	31,826.1	-1.8

Source: BLM Roswell District EIS files
a/ Includes Federal, State, and Private AUs.

See Appendix I TABLE I-2, I-3, I-7, I-11, I-15, and I-19 for estimated costs and returns for each ranch size category.

As the levels of authorized use increases, in the long term, herd sizes would increase and would vary between ranch size category as follows:

Small commercial cow-calf ranch	75.1%
Medium commercial cow-calf ranch	23.3%
Large commercial cow-calf ranch	14.9%
Medium commercial sheep/cow-calf ranch	17.9%
Large commercial sheep/cow-calf ranch	12.9%

Increases in authorized use would restore the 2 small cow-calf operations lost in the short term and would move 4 small cow-calf and 3 medium cow-calf operations up to the next higher category. As the herd size increases, ranch income (Table 3-48) and ranch values would increase. Ranch values would increase above the value in the PA, by approximately 1.6 million dollars.

TABLE 3-48
(MAX) LONG-TERM ESTIMATED RECEIPTS, COSTS, AND RETURNS FOR ALL RANCH SIZE CATEGORIES IN THE ROSWELL RESOURCE AREA

Item	PA	MAX	Percent Change from PA
No. of Operators	76	76	
Gross Income	$6,031,975	$7,104,324	+17.7
Total Cash Costs	3,263,288	3,867,026	+18.5
Returns above:			
Cash Cost	2,768,687	3,237,298	+16.9
Depreciation	1,314,543	1,314,543	NC
Returns to Operator			
Labor, Management, and Capital	1,454,144	1,922,755	+32.2
Total AUs a/	32,432	34,437	+6.1

Source: BLM Roswell District EIS files
a/ Includes Federal, State, and Private AUs.

See Appendix I TABLE I-2, I-4, I-8, I-12, I-16, and I-20 for estimated costs and returns for each ranch size category.

SECONDARY IMPACTS

Secondary Impacts of the alternative on those employed by the ranchers and in the related livestock sector are shown in Table 3-49.

TABLE 3-49
(MAX) CHANGES IN EMPLOYMENT AND PERSONAL INCOME

	BLM Livestock Industry		Related Livestock Industry		Total	
	Jobs	Income	Jobs	Income	Jobs	Income
Short-term loss	- 4	$-10,000	- 2	$-32,000	- 6	$-42,000
Short-term gain a/	59	825,140	33	275,332	92	1,100,000
Long-term gain	34	103,967	29	338,741	63	442,708

Source: BLM RRA Input/Output (I/O) Model
a/ Gains in employment and personal income are short term and are generated by the expenditure of approximately $2.0 million for range improvements.

This alternative would reduce the revenues and income (Table 3-50) generated by the recreational uses of the public lands by approximately $27,000 dollars. This reduction is caused by the reduced big game numbers.

TABLE 3-50
COMPARISON OF THE REVENUES AND INCOME FROM RECREATION
BETWEEN PA AND MAX
(dollars/year)

Activity	PA	MAX
General Recreation	$296,993	$296,993
Hunting:		
Upland Game a/	33,200	33,200
Deer	373,531	354,717
Pronghorn Antelope	22,349	13,929
TOTAL	$759,273	$732,039

Source: RRA Wildlife Files, Sage Ram, NMDG&F
a/ Mourning dove, scaled quail.

DECREASED LIVESTOCK GRAZING (DLG)

Under the DLG, overall stocking rates would be reduced approximately 23 percent from the average five-year-licensed use. This would be a reduction of approximately 4,450 Animal Units (AUs) and would apply to both "M" and "I" category allotments, based on range condition within each allotment. Excess AUs would have to be sold or pastured on other lands owned or leased by the allottee. Short and long-term estimated stocking rates are shown in Table 3-51.

TABLE 3-51
(DLG) ESTIMATED SHORT AND LONG-TERM STOCKING RATES

	Livestock AUMs	Percent Change from Existing Situation
Existing Licensed Use	228,656	0
Short Term	175,017	-23
Long Term	175,017	-23

Source: RRA Inventory Files

IMPACTS OF THE DLG ON

VEGETATION

The reduction in stocking rates would result in decreased utilization of forage species. Forage production would increase approximately 2.0 percent over the amount required to sustain the existing 5-year-average-licensed-use. An overall increase in the density of vegetation would occur, resulting in a subsequent increase in cover (density + litter) as shown in Table 3-52.

TABLE 3-52
(DLG) PERCENT COVER BY RANGE CATEGORY

Range Category	Percent Cover Existing	 DLG
Loamy	60	63
Loamy/Gyp Uplands	52	54
Loamy/Hills	65	67
Limestone Hills	40	42
Malpais	34	34
Sandy	55	57

Source: RRA Inventory Files

In the short-term, reduced grazing pressure would allow forage plants to regain vigor, resulting in increased vegetational ground cover. In the long-term, vegetation response to this reduction would vary according to range site, condition class, and climatic condition. Undesirable brush species would continue their present trend (actual trend will not be known until 1987). Improvement in ecological condition class would occur as some acres in the fair condition move upward. Poor condition rangeland would not be improved without any external manipulations (such as brush control). The projected changes in the number of acres in each ecological condition class is displayed in Table 3-53. Table 3-54 displays the expected long term change in acres in each ecological condition class by range category.

TABLE 3-53
(DLG) LONG-TERM ECOLOGICAL CONDITION CLASSES

Existing (ac.)	Ecological Condition Class	With DLG (ac)
93,666	Undetermined ("C")	93,666
25,332	Excellent	25,332
510,108	Good	774,939
270,093	High-Fair	47,922
70,710	Low-Fair	28,050
23,502	Poor	23,502

Source: RRA Inventory Files

IMPACTS OF THE DLG ON

LIVESTOCK GRAZING

Preference (AUMs allocated) for livestock grazing would be suspended on 23,502 acres of rangeland in poor ecological condition, and reduced 50 percent on 340,803 acres in fair condition. These reductions would apply to both "M" and "I" category allotments, and would be based on the percentage of poor and fair condition rangeland within each individual allotment (see Table 1-4). This would amount to a 23 percent reduction in the number of livestock grazing on public lands.

IMPACTS OF THE DLG ON

SOILS/WATERSHED

Surface runoff would not change in the Loamy/Gyp Upland, Sandy, Malpais, and Limestone Hills range sites. Runoff would decrease 9 percent on Loamy and 19 percent on Loamy/Hills range sites.

TABLE 3-54
(DLG) ECOLOGICAL CONDITION BY RANGE CATEGORY
(FEDERAL ACRES)

Ecological Condition Class		Range Category											
		Loamy	Percent	Loamy/Gyp Uplands	Percent	Loamy Hills	Percent	Limestone Hills	Percent	Malpais	Percent	Sandy	Percent
Excellent		4,160	.4	0	0	0	0	19,892	2.0	0	0	1,280	.1
Good		174,897	17.6	14,292	1.4	24,606	2.5	502,521	50.6	8,393	.8	55,492	5.6
Fair													
High-Fair	+38	12,555	1.3	1,059	.1	1,394	.1	26,749	2.7	0	0	3,452	.3
Low-fair	-38	7,603	.8	0	0	0	0	13,275	1.3	0	0	4,622	.5
Poor		1,480	.1	0	0	0	0	17,743	1.8	0	0	4,280	.4
Undetermined	a/	93,666	9.4	0	0	0	0	0	0	0	0	0	0
TOTAL		294,361	29.6	15,351	1.5	26,000	2.6	580,180	58.4	8,393	.8	69,126	6.9

Source: BLM RRA Inventory Files, 1982-1983.

a/ "C" Category allotments.

Decreased livestock grazing would increase ground cover as shown in Table 3-52. This would result in a slight decrease in wind and water erosion, and a decrease in sediment yields from .40 ac.ft./sq.mi./yr. to approximately .35 ac.ft./sq. mi./yr. Erosion classes will improve as shown in Table 3-55.

TABLE 3-55
(DLG) LONG-TERM CHANGE IN EROSION CLASSES

Existing (ac)	Class	With DLG (ac)
59,605	Stable	60,605
784,795	Slight	786,795
129,143	Moderate	130,143
19,868	Critical	15,868

Source: RDO Watershed Files.

Average water consumption by livestock would be expected to decrease to 175,000 gallons per day in the long term. The decrease would provide approximately 59 acre feet of water annually for other uses and would amount to much less than a 1 percent increase in availability. Water quality would improve due to a decrease in runoff and sediment yields.

IMPACTS OF THE DLG ON
WILDLIFE

SPECIAL HABITAT FEATURES

Riparian habitat would remain unchanged from the existing condition. Although the riparian vegetation would benefit from decreased livestock utilization, lack of seasonal grazing control afforded by grazing systems would prevent any major improvement in ecological condition.

BIG GAME

Desert Mule Deer. Habitat condition would be improved as ecological condition classes improve from the decreased grazing pressure (Table 3-50). The additional available forage and cover would support approximately 370 more desert mule deer (for a total of 2,179).

Pronghorn Antelope. The reduction in livestock grazing and subsequent improvement in ecological condition classes would benefit pronghorn antelope. Additional forage would be available for use by pronghorn which are estimated to increase to a total of 436 (51 more animals).

Total demand for big game AUMs (deer and antelope) would be 3113 AUMs, out of the 4,480 AUMs currently reserved for wildlife.

GAME BIRDS

Mourning Dove. Mourning dove habitat would be slightly improved by the increase in seed-producing grasses and forbs which would be expected with improved ecological condition. The improvement would not appreciably affect population numbers.

Scaled Quail. The increase in seed-producing grasses and forbs would also slightly improve quail habitat. Quail populations would continue to fluctuate as normal, and would not experience a measurable change as a result of the decreased livestock grazing.

IMPACTS OF THE DLG ON

THREATENED AND ENDANGERED PLANTS AND ANIMALS

No adverse impacts would occur on T/E plants or animals. Improved ecological condition would generally benefit T/E species. Decreased grazing pressure would benefit plants directly impacted by livestock grazing, such as the Guadalupe milkvetch.

IMPACTS OF THE DLG ON

AIR QUALITY

Air quality would not be adversely impacted under this alternative, would be slightly enhanced by increases in production and cover.

IMPACTS OF THE DLG ON

CULTURAL RESOURCES

Cultural resources would benefit from the decreased grazing pressure which would reduce the potential for site trampling by livestock.

IMPACTS OF THE DLG ON

RECREATION

The reduction of livestock under this alternative would increase deer and antelope numbers by an estimated 15 percent. This increase in wildlife would provide additional hunting opportunities for the public. Table 3-56 displays the recreational opportunities afforded by the increased hunting.

TABLE 3-56
(DLG) HUNTING/RECREATION VISITATION

Activity	Existing Situation	with DLG
Hunting		
Deer		
Visitor Hours	52,536	61,651
Antelope		
Visitor Hours	2,620	2,967
Total	55,156	64,618

Source: RRA Wildlife files; NMDG&F

The decrease in grazing pressure would generally not change the erosion classes or sediment yield of the planning area. Decreases in livestock numbers in areas where range condition has deteriorated would improve the watershed near special cave resources. The local improvement in watershed would be a benefit to cave resources.

IMPACTS OF THE DLG ON
VISUAL RESOURCES

Visual resources would be slightly enhanced by the increased vegetation not used by livestock and improved ecological condition classes.

IMPACTS OF THE DLG ON
SOCIOECONOMIC CONDITIONS

Decreased livestock grazing on the public lands would, in the short term and the long term, adversely impact the ranch operator. Herd sizes would be reduced, by ranch category as follows:

	Short Term	Long Term	Total Adjustments
Small commercial cow-calf	-31.8%	0	-31.8%
Medium commercial cow-calf	-13.3%	0	-13.3%
Large commercial cow-calf	- 9.2%	0	-9.2%
Medium commercial sheep/cow-calf	-20.4%	0	-20.4%
Large commercial sheep/cow-calf	-11.2%	0	-11.2%

These reductions would eliminate 1 small cow-calf operation and 8 medium sheep/cow-calf operataions would become non-selfsufficient (less than 275 AUs). Due to these reductions ranch income would decrease; Table 3-57 shows the impacts to ranch income.

TABLE 3-57
(DLG) SHORT AND LONG TERM ESTIMATED RECEIPTS, COSTS, AND RETURNS FOR ALL RANCH SIZE CATEGORIES IN THE ROSWELL RESOURCE AREA

Items	PA No Action	DLG Short Term	DLG a/ Long Term	Total % Change
No. of Operators	76	75	NC	
Gross Income	6,031,975	4,855,740	NC	-19.5
Total Cash Costs	3,263,288	2,480,099	NC	-24.0
Returns above				
Cash Costs	2,768,687	2,375,641	NC	-14.2
Depreciation	1,314,543	1,314,543	NC	0
Returns to Operator Labor Management, and Capital	1,454,144	1,061,098	NC	-27.0
Total AUs b/	32,432	27,956	NC	13.8

a/ NC = No change in economic conditions from short term through long term.
b/ includes Federal, State and Private AUs

See Appendix I, Tables I-3 through I-20 for estimated costs and return for individual ranch size categories.

As herds are reduced income would temporarily increase, but would fall rapidly due to decreased production. As level of permitted grazing drops ranch values would decrease by approximately 5.4 million dollars.

Impacts to the regional economy would be slight; seventy job opportunities and approximately $500,000 in personal income would be lost. Table 3-58 shows the short and long term changes in the regional economy.

TABLE 3-58
(DLG) SHORT AND LONG TERM CHANGES IN PERSONAL INCOME AND EMPLOYMENT

	BLM Livestock a/ Industry		Related Livestock Industry		Total	
	Jobs	Income	Jobs	Income	Jobs	Income
Short Term Loss	-39	-$113,702	-31	-$372,873	-70	-$486,575
Long Term Loss	- 0	0	- 0	- 0	- 0	- 0
TOTAL	-39	-$113,702	-31	-$372,873	-70	-$486,575

Source: BLM Roswell Input/Output (I/O) model
a/ Relates to full-time and part-time hired help

This alternative increases revenue and income (Table 3-59) received from recreational use of public land by approximately $68,000. The increased income is caused by increased numbers of deer and antelope.

TABLE 3-59
COMPARISON OF REVENUES AND INCOME FROM RECREATION
BETWEEN PA AND DLG
(dollars/year)

Activity	PA	DLG
General Recreation	$330,193	$330,193
Hunting:		
Upland Game a/	33,200	33,200
Deer	373,531	438,388
Antelope	22,349	21,470
TOTAL	$759,273	$827,090

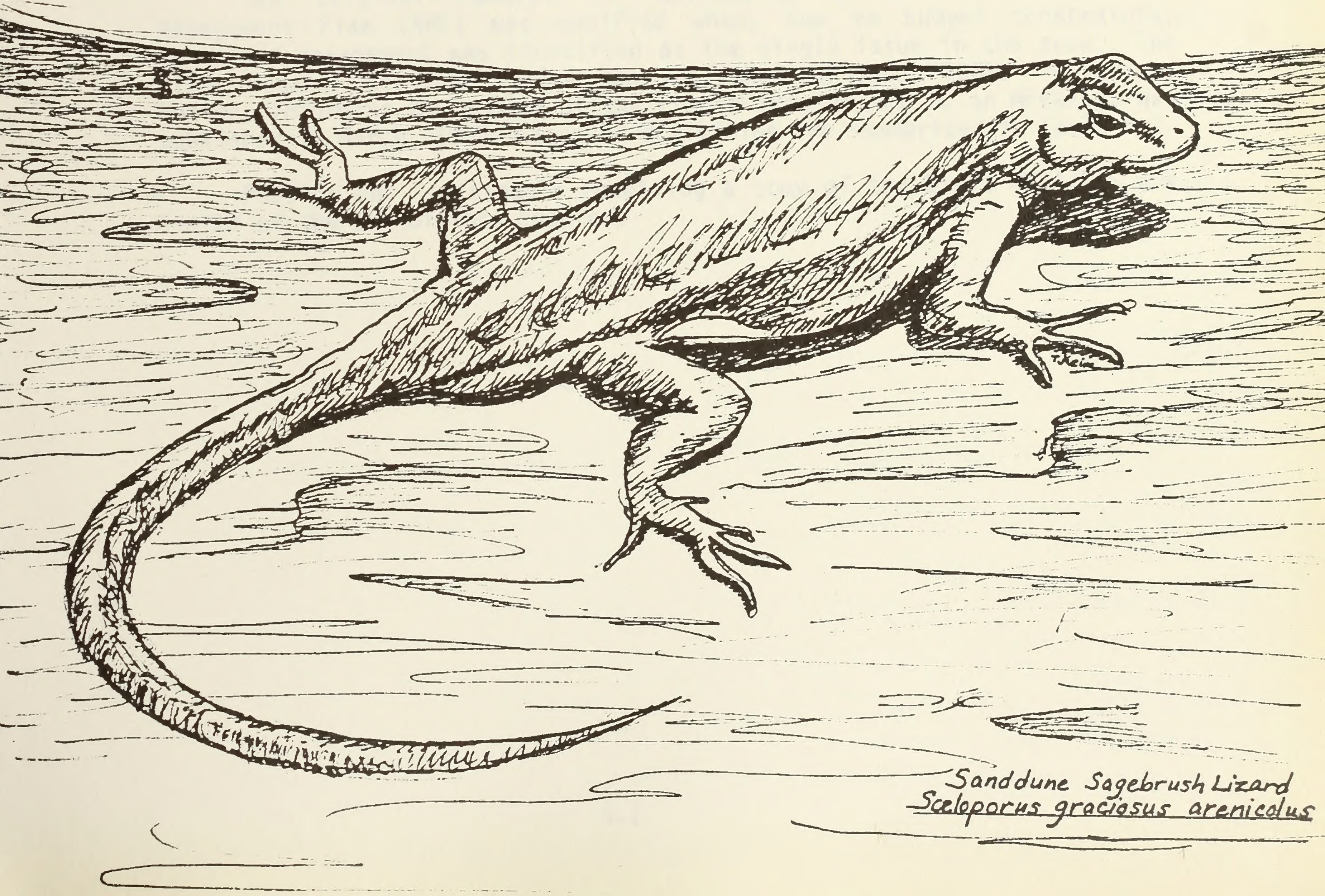
Source: RRA Wildlife Files, Sage Ram, NMDG&F
a Mourning Dove and Scaled Quail

CHAPTER 4

CONSULTATION AND COORDINATION

HOW TO READ CHAPTER 4

Chapter 4 briefly outlines the procedures used to inform the public of the development of this Environmental Impact Statement. A list of the document preparers and the document mailing list can be found on pages 4-2 and 4-4.



Sanddune Sagebrush Lizard
Sceloporus graciosus arenicolus

CHAPTER 4

CONSULTATION AND COORDINATION

INTRODUCTION

This chapter summarizes the consultation and coordination conducted in preparation of the Draft MFPA/EIS. A list of preparers is provided in Table 4-1.

Public Involvement

Scoping for the Roswell MFPA/EIS originated with the development of a Public Participation Plan and Issue Identification in the summer of 1981. Planning Criteria were developed in the fall of 1981 with input from the public and the District Grazing Advisory Board. Throughout the planning process, Federal, State, and local agencies, special interest groups, and other individuals were contacted. The contacts were made to inform the public about the planning process, to gather resource information, and to identify issues for consideration.

A general notice at the outset of the planning process inviting participation in the identification of issues and a notice inviting public comment on the planning criteria were circulated through Federal Register Notices, news releases, correspondence, and public meetings.

The original concept of developing a multi-issue Resource Management Plan (RMP) was modified when, due to budget constraints, rangeland management was identified as the single issue in the area. The first Federal Register Notice was published in June, 1981. A revised Notice, informing the public of the change from an RMP to an MFPA/EIS was published in March, 1983. Scoping activities are summarized in Table 4-2.

Publics and individuals receiving a copy of the Draft MFPA/EIS are listed at the end of this chapter.

TABLE 4-1

LIST OF PREPARERS

Name	MFPA/EIS Responsibility	Education	Years of BLM Experience
Phil Kirk	Area Manager	B.S., Range Management New Mexico State University	22
Linda S.C. Rundell	Team Leader	B.S., Wildlife Science New Mexico State University	5
T. Pat Kelley	Community Planner	B.S., Range Management B.S., Soil Science California State University	4
A. Ray Keller	Range Condition, Range Improvements, Assumptions; Range Monitoring and Inventory Team Leader	B.S., Range Animal Science Sul Ross State University	7
Vicky K. Taylor	Vegetation, Livestock Grazing, Brush Control	B.S., Wildlife Science B.S., Range Science New Mexico State University	3
Michael O. Howard	Wildlife, Chemical Toxicity	B.S., M.S., Wildlife Science Sul Ross State University	5
Joseph B. Hummel	Recreation	B.S., Natural Resources Humboldt State University	8
Clarence Seagraves	Watershed, Air Quality	B.S., Agronomy New Mexico State University	11
James Konopinski	Watershed, Air Quality	B.A., Geography Bowling Green State University	2
E. Ann Ramage	Cultural Resources	B.A., Anthropology University of New Mexico	7
Teodoro Rael	Economics	M.A., Economics New Mexico Highlands University	6
Larry LaPlant	Pronghorn Antelope Study	B.S., Wildlife Management University of Montana	5
Angelina Medina	Support	Del Norte High School Albuquerque	3
Linda S. Hewitt	Support	B.S., English Eastern New Mexico University	1

Illustrators:

Front Cover	Roy Stovall
Interior Sketches	Terry Keim

TABLE 4-2
SCOPING ACTIVITIES

Method of Contact	Date	Location
Federal Register Notice	6/25/81	
Public Meetings:	7/21/81	Portales
	7/21/81	Clovis
	7/22/81	Tucumcari
	7/22/81	Santa Rosa
	7/23/81	Fort Sumner
	7/27/81	Roswell
	7/28/81	Carrizozo
	7/31/81	Ruidoso
Meetings:		
Southeastern New Mexico Grazing Association	8/12/81	Roswell
District Grazing Advisory Board	8/19/81	Roswell
Advisory Council	10/7/81	Roswell
General Public	10/1/82	Roswell
Federal Register Notice	3/10/83	
Request for Public Comment - letter	3/14/83	
Meetings:		
General Public	3/30/83	Roswell
Southeastern New Mexico Grazing Association	4/18/83	Roswell
Advisory Council	5/12/83	Roswell
Planning Update - letter	7/27/83	
District Grazing Advisory Board	8/23/83	Roswell

ROSWELL RESOURCE AREA DRAFT MFPA-EIS MAILING LIST

Congressional Offices and NM State Legislators

- US Senator Jeff Bingaman
- US Senator Pete Domenici
- US Congressman Joe Skeen
- US Congressman Manuel Lujan, Jr.
- State Senator Joe Gant
- State Senator Timothy Jennings
- State Senator Bud H. Hebert
- State Representative Robert B. Corn
- State Representative Tandy L. Hunt
- State Representative Richard Knowles
- State Representative Marvin B. "Mickey" McGuire

Federal Agencies

- Department of Agriculture
  - Agricultural Stabilization & Conservation Service
  - Lincoln National Forest
  - Soil Conservation Service
- Department of the Army
  - Corps of Engineers
- Department of the Interior
  - Bureau of Indian Affairs
  - Bureau of Land Management
  - Bureau of Mines
  - Bureau of Reclamation
  - National Park Service
  - Carlsbad Caverns & Guadalupe Mountains National Park
  - Fish and Wildlife Service
- Environmental Protection Agency
- Office of Public Awareness

State Agencies

- Department of Agriculture,
  Dr. Wm. Stephens, Director
- Department of Game & Fish
- Eastern Plains Council of Governors
- Environmental Improvement Division, Dist. 4
- Governor's Office
- Highway Department
- Historical Preservation Bureau
- Land Office, Jim Baca, Commissioner
- Museum of NM Laboratory of Anthropology
- Oil Conservation Division
- Parks Commission
- Soil and Conservation Commission
- State Engineer
- State Planning Office
- Water Resources Division, Dist. 2

County Offices

- Chaves
- Curry
- Eddy
- DeBaca
- Guadalupe
- Lea
- Lincoln
- Roosevelt
- Quay

Libraries

- ENMU
- ENMU-R
- NMSU

City Offices

- Carlsbad
- Clovis
- Eunice
- Jal
- Portales
- Roswell
- Tucumcari
- Town of Tatum
- Village of Ft. Sumner, Inc.

Non-Government

- Aubrey S. Johnson
- Carlsbad Sportsmens Club
- Central NM Audubon Society
- Chaves County Wildlife Federation
- Dr. Katherine A. Green-Hammond
- Federal Land Bank of Roswell
- Lea County Wildlife Federation
- Middle Rio Grande Conservation District
- National Council of Public Land Uses
- Natural Resources Defense Council
- Nature Conservancy
- New Mexico Beef Council, Rick Shaw
- New Mexico Wildlife Federation
- New Mexico Farm and Livestock Bureau
- New Mexico Field Office, The Nature Conservancy
- New Mexico Natural History Institute
- New Mexico Public Lands Council
- New Mexico Rural Water Users Association, Inc.
- New Mexico Stockman, Editor
- New Mexico WoolGrowers, Inc.
- Public Lands Council, National Cattlemen's Assn.
- Public Lands Institute
- Southeast New Mexico Grazing Association
- Southeast New Mexico Audubon Society
- Sierra Club, Rio Grande Chapter
- Society for Range Management
- The Outdoor Reporter, Editor
- Dr. Sam Beasom
- Wildlife Management Institute

Universities

- New Mexico State University,
  - College of Agriculture and Home Economics
  - Dr. Arnold Nelson, Department of Animal and Range Science
  - Dr. Charles A. Davis, Department of Fishery and Wildlife Science
  - Dr. James, E. Knight, Cooperative Extension Service
  - Dr. Jerry G. Schickedanz, Range Improvement Task Force
- Texas Tech University, Dept of Range & Wildlife Management

District Advisory Council/ Grazing Advisory Boards

Armstrong, Robert G.
Atkinson, Herb
Berry, Daniel C.
Byrd, James L.
Eppers, Bud
Walls, James R.
Watts, Marvin L.
Watts, Sonny
Wood, Jerry E.

Ranch Operators

Adams, Clarence
Anderson, Michael
Armstrong, Robert G.
Armstrong, G. G
Arroyo Seco, Inc.
Atkins, Hubert
Avants, Alma
Ball, William J.
Bar W Ranch, Inc.
Bedford, H. G
Benedict, E. N.
Bird Ranch
Blackwell, E. Clyde
Blakey, Bill B.
Block Dot Ranch, Inc.
Bond, E. T. Dimmitt
Brady, Mrs. W. H.
Brassell Brothers
Brown, Dale W.
Brown, B. L. & R. C.
Bryan, Edward O.
Burguette Bros.
Byrd, Bob H.
Byrd, Suelena
Campos, Emerenciano
Campos, Pelagio
Carruthers, Odell
Casarez, Rosendo
Chavez, Ernesto
Chavez, Manuel Sr.
Chavez, Paul M.
Chesser Ranch, Inc.
Childress Ranch
Circle F Ranch, Co.
Cliett, James
Connell Ranches, Inc.
Cooper, Mrs. Joyce M.
Cooper, Thomas S.
Cordova, Amelia K.
Corn, Bronson

Ranch Operators

Corn Brothers Trust
Corn, Fred B. & Sons
Corn, Herbert
Corn, James
Corn, Mike W.
Corn, Poe Est.
Corn, Ruth
Corn, Tom
Corn, W. H. Est.
Cortese, Joe
Crenshaw, Robert
Daniels, J.W. Est.
Davidson, Jack Jr.
Davis, A. E. Sr.
Davis, H. H.
Dean, Charles & Betty
Diamond A Cattle Co.
Diamond L Ranch, Inc.
Draper, Mark R.
Dunlap, Tom
Edgar, William J.
El Yeso Ranch Co.
Eldridge, Grady
Elliott, Helen N.
Eppers, H. W., Jr.
Erramouspe, Inc.
Ewart, James P.
Fen Met Co.
Flores, Alfredo
Fresquez, Lutario
Garcia, Jose M. Est.
Gates, Albert
Gibbons, J. P. Trust
Gist, Fred & Velma
Glass, David
Glenn, William E.
Gnatowski, A. W.
Gomez, Marie Pacheco
Good Ranch Trust
Gooding Ranch
Gunter, Roy Jr.
Gutierrez, Annie Est.
Hage and Webb Land
Hall-Gnatowski, Inc.
Harkey, Howard
Harkey, Jack N.
Helms, A. D.
Henderson, Matthew
Hendricks, Wilda K.
Hicks, John L.
Henry, Clifford C.
Hightower Land & Cattle

Ranch Operators

Hindi Sheep & Cattle
Hisel, Don L.
Hnulik, Ellis
Horney, Zola G.
Hornsby Land & Cattle
Hunt, Clay
Jackson, Leland C.
Jackson, Carroll Est.
Johnson, B. A. Est.
Johnson, Carl
Johnson, S. P. Jr.
Johnson, W. F. Estate
Jones, Preston
Kelly, Kap
Key, Marvin
Killough, Alan Joe A.
Knight, Thomas A.
Leftwich, J. R. Est.
Liakos, William G.
Lietzman, Robert W.
Lopez, Julian
Lovelace, W. R.
Lucero, Benerito
Lynch, Gary
Marley, Clyde and Robert
Marley Ranches, Ltd.
Marley, William T. F.
Marleys Gallo Ranch
Martin, Jerry Don
Martinez, Solomon P.
McBrayer, A. J.
McCabe, Silas
McCall, Hobby
McCan, Mike
McCarty, William G.
McDaniel, W. W. Est.
McDonald, Laura Est.
McInnes & Fuchs
McKnight, Douglas
McKnight, Joe W.
McKnight, J. P.
McKnight, W. D.
McLean, Mrs. Ella S.
McNally, Inc.
McTeigue, Jimmy
Mendiola, Peter
Merritt, J. L.
Merritt, Ronald L.
Metcalf, L. E. Est.
Miles - Langenegger
Miller, Bertha C.
Mitchell, Tom

ROSWELL RESOURCE AREA DRAFT MFPA-EIS MAILING LIST (Continued)

Ranch Operators

Moats, Betty Jean
Mooney, F. Olin Sr.
Morris, Leon
Nalda, John
Newton, Doyle
Northcutt, Elmer
Nunez, R. C.
One Hundred Ranch
Overton, Tyne E.
Pacheco, L. A.
Padilla, Jose F.
Parker - Townsend
Pastura Ranch
Peacock, Ruben
Pendery, Mrs. Clinton
Perez, Eugene Jr.
Perez, Raymond
Perschbacher, J. A.
Pierce, Truman
Pittman, Bobby L.
Price, George
Procter, Floyd
Rafter X, Inc.
Ramon Perez Ranch
Reilly, Ltd.
Roadrunner Ranches
Rogers Ranch
Roller, Grace

Ranch Operators

S Bar J Ranch, Inc
S and S Corporation
Sacra, Glaze
Saiz, Luis
Salas, Danney
Sanchez, Abelino E.
Sanchez, Alfredo
Sanchez, Arsenio
Sanchez, Felipe Jr.
Sawyer, Fern
Sena, Martin T.
Shanks Bros., Inc.
Shrecengost, Margaret
Sidwell, G. B.
Sisneros, George
Slayton, Paul
Smith, A. D.
Smith, Frank J.
Spool Cattle Co.
Stephenson Ranch, Inc.
Stevenson, C. A. & Max
Studdard, Jack
Sultemeier, Clint
Sultemeier, Ernest
Sultemeier, Frank
T - 7S Ranch, Inc.
Tapia, Arturo
Tapia, Edmundo

Ranch Operators

Tapia, Erlindo
Tapia, Placido
Taylor, Bennie R.
Teel, Fred
Thompson, M. G.
Thompson, Melville D.
Townsend, Henry
Townsend, Gayland
Tucker, Finus Trust
Tucker, Thomas E.
Van Eaton, Fred
Vaughn Enterprises
Wagner, Charles & Betty
Washburn, Lorena W.
Whipple, Ray A.
White, J. Phelps III
White, Joe H.
Williams, S.S.
Wilson, Charles P.
Winn, Madison A.
Withers Ranch
Womer, Paul E.
Woodys Acres, Inc.
X-Bar Ranch, Inc.
Yriart, Robert M.
Z. R. Hereford Ranch

APPENDICES

APPENDICES

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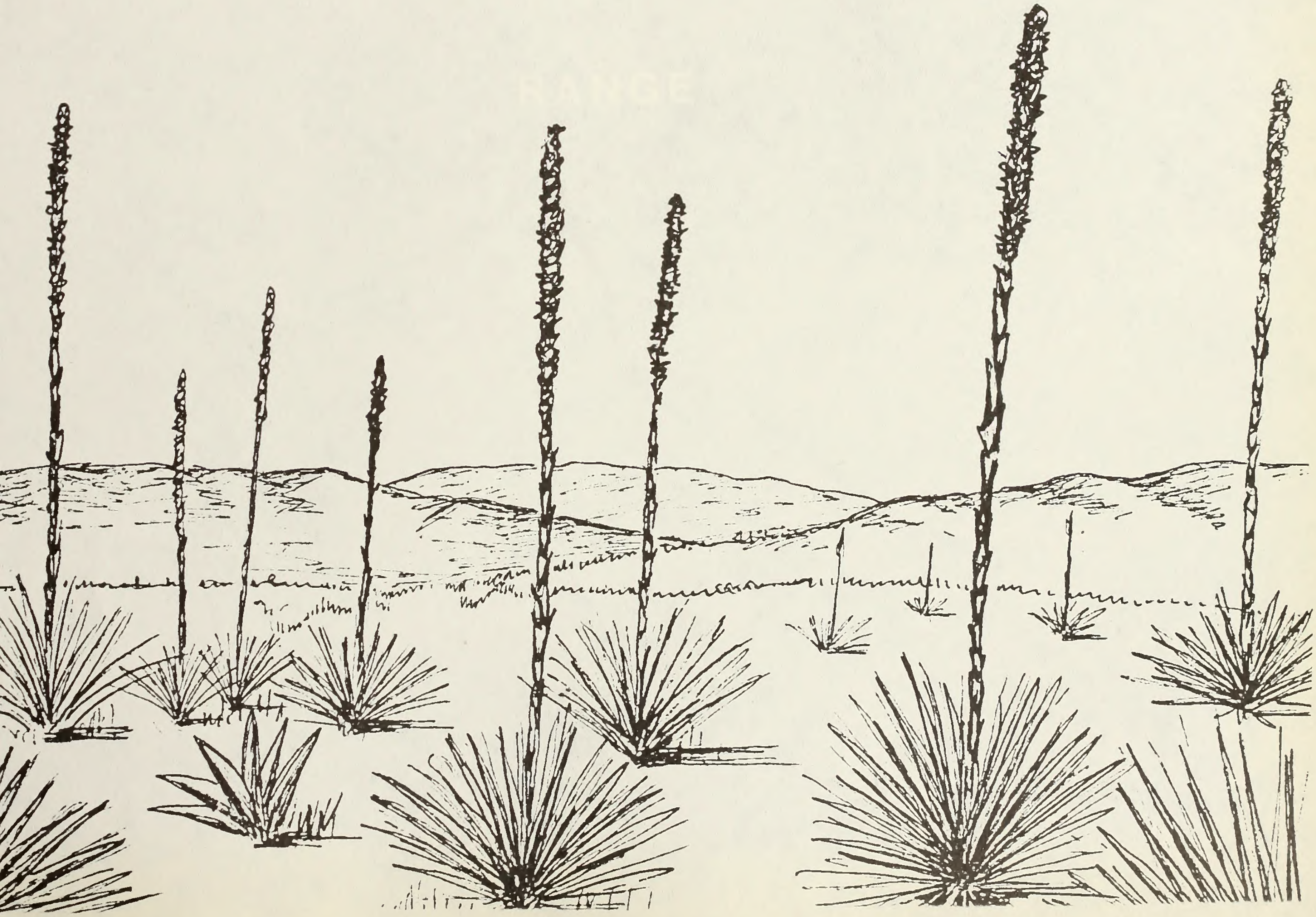

APPENDIX A

RANGE

APPPENDIX A-1

METHODOLOGY - INVENTORY AND MONITORING

Beginning in the summer of 1981, range sites were transferred from Soil Conservation Service aerial photographs to U.S. Geological Survey topographic maps. (A range site is a distinctive type of rangeland characterized by the amount, proportion, and kind of plant species produced. The production of a plant species is, in turn, determined by variations in soil types, climate, and topography).

Maps with allotment boundaries were made from the topographic maps. Major range sites and their key areas were determined for each pasture. (A key area is the portion of a pasture which, because of location, grazing value, and/or use, is a representative sample of the entire pasture).

Initial condition was determined at the key areas on the study allotments. (Initial condition was not determined on those allotments with less than 30 percent public land and/or 1540 acres or less public land). The two-phase ocular-reconnaissance method used to determine initial condition is described in the Roswell District BLM methodology book.

Starting in January 1982, study sites were selected in consultation with the rancher, at the key areas in each pasture, to monitor vegetative changes. These monitoring studies consist of five parts:

1. Precipitation
2. Actual Use
3. Forage production
4. Ecological condition and trend
5. Utilization

Precipitation. A permanent marker stake is located at each study site. A 6" capacity rain guage is fixed to this stake. Actual precipitation information is gathered from March through October. Winter precipitation is obtained from a local agency.

Actual Use. Actual use is the grazing use made of an area by livestock. This information is supplied by the livestock operator.

Forage production. Production studies are conducted in the fall at the end of the growing season. A weight-estimate method is used to determine production. Three transects are established at approximately 120 degrees intervals. The three transects are 100 paces in length each. (One pace equals two steps). At every 10 paces, the vegetation within a 4.8 square foot plot is clipped, weighed, and recorded. The three 100 pace transects may be run in one line in order to stay within the range site. Once estimates of weights are within 10 percent of actual weights, plots may be estimated.

Ecological condition and trend. Ecological range condition is the present state of vegetation on a range site as compared to the potential or climax plant community that the site is capable of producing. Potential plant communities on all range sites are described in Technical Guides written by the Soil Conservation Service 1980. The three 100 pace transects taken for forage production are used to establish a base for ecological condition. Condition is determined by measuring the percentage of total production that each species makes up. The numerical rating is then determined by counting the amount of all climax species not in excess of that shown in the range site guide. The rating is between 0 and 100, depending on how closely the existing plant community resembles climax. The following condition classes are used to express range condition.

Condition class	Percentage of potential or climax condition
Excellent	76-100
Good	51-75
Fair	26-50
Poor	0-25

Trend is the change in vegetation and soil characteristics as a direct result of environmental factors, primarily grazing and climate. The weight-estimate by species taken for condition is used to establish trend. In addition, percent composition and percent cover by species (point-pace transects) are used for trend determinations. Trend information is collected the first and fifth years of monitoring and subsequently compared. A 3' x 3' trend plot is established at the key area. A photograph of the trend plot and a general view photograph is taken the first and fifth years of monitoring.

Utilization. Utilization is defined as the degree of herbage removed. Utilization information is gathered in the spring on the previous years growth, prior to any significant new growth. Utilization is determined on one or more key species, and on the area as a whole, by an ocular-estimate method. A key species is potentially abundant, endures moderate grazing, and serves as an indicator of changes occurring in the vegetational complex. A 9.6 square foot protected plot is established for visual comparison in each key area. One 200 pace transect is used to determine utilization. At every twentieth pace along the transect, the utilization class is estimated. Utilization classes are used to show five relative degrees of use. The descriptive term represents a numerical range of percent utilization. Utilization classes are described below.

> Slight (0-20%): Range shows no evidence of use by livestock, or range has the appearance of very light grazing. The key forage plants may be topped or slightly used. Current seedstalks and young plants of key species are little disturbed.
>
> Light (21-40%): Range may be topped, skimmed, or grazed in patches, low value plants ungrazed; 60 to 80 percent of the

number of current seedstalks of key plants remain intact. Most young plants are undamaged.

Moderate (41-60%): Range appears entirely covered as uniformly as natural features and facilities will allow. Fifteen to 25 percent of the number of current seedstalks of key species remain intact. No more than 10 percent of the number of low value forage plants utilized. (Moderate use does not imply proper use).

Heavy (61-80%): Range has appearance of complete search. Key species almost completely utilized with less than 10 percent of the current seedstalks remaining. Preferred shrubs hedged, shrub clumps may be slightly broken, shoots of rhizomatous grasses missing. More than 10 percent of the number of low value forage plants utilized.

Severe (81-100%): Range has mown appearance. Indications of repeated coverage. No evidence of reproduction or current seedstalks of key species. Key forage species completely utilized. Remaining stubble of preferred grasses grazed to soil surface. Shrub clumps hedged or broken.

Ecological condition by itself may not necessarily describe the productivity of a site or indicate its value for the grazing of livestock, watershed protection, or wildlife management objectives. It is, however, an appropriate measure to use to compare the existing plant community with the potential for a particular range site.

For a detailed description of methodology used in inventory and monitoring, see the methodology book located at the Roswell Resource Area BLM office.

METHODOLOGY USED IN CATEGORIZATION

The Range Management Policy of March 1982 (Washington Office Memorandum 82-292) requires the Bureau of Land Management to categorize allotments. All allotments are grouped into one of three resource management categories: M-Maintain, I-Improve, C-Custodial. This categorization is designed to facilitate assigning management priorities among allotments.

On February 23, 1982 the BLM held a meeting with the Roswell District Grazing Advisory Board to jointly determine the criteria for allotment categorization. The criteria agreed upon by the Grazing Advisory Board, and adopted by the Roswell District BLM follows:

ROSWELL RESOURCE AREA

RANGE CATEGORIZATION CRITERIA

CATEGORY M (MAINTAIN)	CATEGORY I (IMPROVE)	CATEGORY C (CUSTODIAL)
An allotment must meet conditions 1, 2, & 3 or 1, 2, & 4 (below):	An allotment must meet any one of the following 3 conditions:	An allotment must meet all of the following conditions:
1. Has no significant resource conflicts.	1. Has a potential significant resource conflict.	1. Has no significant resource conflict.
AND	OR	AND
2. Has only a moderate potential for improvement in forage production.	2. Has a high potential for improvement in forage production and a range condition rating of 50 or less.	2. Has a low potential for improvement in forage production.
AND	OR	
3. Has a range condition rating of 38 to 51 and an improving range trend.	3. Has a range condition rating of 50 or less and a static or declining range trend.	OTHER CONSIDERATIONS Contains less than 30% public land or less than 1,540 acres public land.
OR	OTHER CONSIDERATIONS Contains 30% or more public land or more than 1,540 acres public land.	
4. Has a range condition of 51 or higher and a static or improving range trend.		
OTHER CONSIDERATIONS Contains 30% or more public land or more than 1,540 acres public land.		

NOTE: Any parcel of public land, regardless of size, with an identified significant resource conflict, will qualify for the "I" category.

According to the category each allotment is placed in, different management actions will be taken. The following is a list of these management actions which could occur by category.

Maintain Category (proposed actions by allotment)

Proposed grazing operations:
- Normal grazing operation (proper season of use, number and kind of livestock).
- Increases in livestock grazing use.

Monitoring at intensity needed to detect undesirable changes.
Allowable range improvements.
CMP development.
Standard operating procedures.

Improve Category (proposed actions by allotment or groups of allotments)

Proposals for resolving identified issues and conflicts, including:
Initial stocking levels (season of use, number and kind of livestock).
Constraints on livestock grazing use needed to protect or enhance other resource uses and values.
Production inventories and vegetation or forage allocations needed to resolve conflicts.
Monitoring at intensity needed to help resolve issues and conflicts.
Site-specific range improvements (if known), or typical improvements needed to meet multiple-use objectives.
CMP development proposed.
Standard operating procedures.

Custodial Category (proposed actions by allotment)

Proposed grazing operations:
- Normal operation (season of use, number and kind of livestock).
- Licensing on an ephemeral forage basis.
- Livestock use excluded.

Monitoring at intensity needed to protect existing resource values.
Allowable rangeland improvements.
CMP development proposed.
Standard operating procedures.

Allotment categories will be periodically evaluated, during the five year monitoring program, to determine if the allotment characteristics have changed significantly enough to warrant a change in categories.

Appendix A-1 (continued)

"M" and "I" category allotments will be monitored through the use of rangeland studies designed to detect changes in range condition and trend.

The results will be analyzed at 3 year intervals on the "I" category allotments and at 5 year intervals on the "M" category allotments. Depending on the results of these studies, it will be determined if the allotment should remain in its present category or be moved to another.

At anytime a significant resource conflict is identified on an "M" or "C" category allotment, it will be considered for inclusion in the "I" category until the conflict is resolved.

BLM will continue to evaluate and make decisions on all actions relating to grazing and range improvements on all allotments, regardless of the category.

East Roswell Grazing EIS Categorizations

Allotment categorizations made subsequent to the FEIS in the East Roswell area are listed in Appendix B-4.

APPENDIX A-2

BUREAU OF LAND MANAGEMENT, NEW MEXICO
RANGELAND CONSULTATION, COOPERATION, AND COORDINATION POLICY
SECTION 8, PUBLIC RANGELANDS IMPROVEMENT ACT (P.L. 95-514)

Purpose. Section 8 of PL-95-514 specifically requires consultation, cooperation, and coordination with lessees, permittees and landowners, the District Grazing Advisory Boards, and State agencies involved in the development, revision or evaluation of allotment management plans (hereinafter referred to as Cooperative Management Plans [CMPs]). It is the intent of the Bureau of Land Management, New Mexico, to expand the concept of consultation, cooperation, and coordination (hereinafter referred to as consultation) into all phases of the grazing program which includes programs and policies and the execution of such programs and policies which affect grazing.

Introduction. The procedures apply specifically to the target group but also may apply to other affected interests. These procedures consist of seven phases and are intended to ensure compliance with Section 8 of PL-95-514. These phases are:

I. Preplanning and Allotment Categorization.

II. Inventory and Inventory-Related Studies.

III. Resource Management Plan (RMP), Management Framework Plan (MFP) Amendment (Grazing), and Environmental Impact Statement (EIS) Development.

IV. Rangeland Program Summary and Updates.

V. Livestock Adjustments, Grazing Programs, Cooerative Management Plans, Revisions, or Evaluations.

VI. Rangeland Monitoring.

VII. Documentation.

Phase I

Preplanning

A. The District or Area Manager will notify grazing permittees by letter concerning the consultation process and listing membership of the target group.

B. The District Manager or his representative will contact the target group at the beginning of the preplanning analysis to request their input into the identification of issues.

C. In coordination with the target group, the District will initiate allotment analysis and will develop standard and site-specific criteria for allotment categories (M) maintain, (I) improve, and (C) custodial and will make initial categorization of each allotment. Review and comment will be requested of the target group in the development of category criteria and again after the initial categorization of allotments.

D. The District Manager or his representative shall meet with the target group and on a one-to-one basis with each owner-operator, then with groups of owner-operators to insure that their ideas and concerns are considered.

E. Following steps A, B, and C, all affected parties will be provided a summary of issues for their review and comment before finalization. A final revision of the issues will be mailed to each party.

Phase II

Inventory and Inventory-Related Studies

A. The District Manager or his representative will notify the target group of the inventories and inventory-related studies to be conducted, including the proposed timeframe for conducting the inventories or studies.

B. Prior to the initiation of each inventory or inventory-related study, the target group will be notified of the inventories and inventory-related studies and their participation will be requested.

C. All inventory and/or study teams shall coordinate a date and time with the permittee and shall stop at the ranch headquarters on the first day of the inventory or study on an allotment. If the allottee is absent, a note will be left indicating the work being done and the locations of each crew.

Phase III

Resource Management Plan (RMP), Management Framework Plan (MFP) Amendment (Grazing), and Environmental Impact Statement (EIS) Development

A. Consultation with the target group, along with interested publics, is required under the Land Use Planning Process (see 43 CFR 1610.3) and will be carried out as stated in 43 CFR 1610.2, public participation.

B. The District Manager or his representative shall contact the target group to request their involvement during the allotment analysis process (I.B. and II.C.). The results of the various inventories and studies, i.e., forage availability, range condition, forage production, prior weather effects, utilization, wildlife habitat needs, socioeconomic needs, watershed needs, final allotment categorization, etc., will be discussed with these participants during this contact. The Allotment Analysis Review will include discussion on the need for CMP vs. no CMP, design of the grazing program, locations of range improvements, land treatment potential, etc.

Phase IV

Rangeland Program Summary and Updates

A Rangeland Program Summary (RPS) will be targeted for release within 5 months following release of the Final Environmental Impact Statement (FEIS). The District Manager or his representative shall make contact with the target group within 3 months to review the Draft RPS. The thrust of this phase will be to seek mutual agreement on the RPS. In the event of disagreements, further consultation may be necessary with the District Advisory Council. It is essential that this phase be conducted in an atmosphere of mutual trust, since all subsequent range-related actions will hinge on this document. After completion, periodic (annual) updates of the RPSs will be issued.

Phase V

Livestock Adjustments, Grazing Programs, Cooperative Management Plans, Revisions or Evaluations

A. Allottees may request the participation of the target group with BLM in the development, revision, or evaluation of a CMP or other livestock management consideration.

B. Individual allottees and the State Land Commissioner, where State lands are involved, will be contacted prior to consultations concerning the adjustment of grazing use. It is not the intent of BLM to contact all members of the target group prior to the actions discussed in this phase, but rather to request their assistance in the resolution of differences between allottees and BLM.

C. A copy of all proposed decisions involving State land will be provided to the State Land Commissioner and any of the target group who has expressed an interest in a particular allotment or geographic area. In those situations where BLM has issued proposed decisions and protests have been filed, and the allotment includes State land, the State Land Office and any of the target group who has expressed an interest in a particular allotment or geographic area will be advised and will be invited to participate fully in all meetings and/or actions pertinent to the proposed decision and subsequent protest.

D. In the course of consultation between the target group and BLM regarding initial stocking rates following a Grazing Environmental Impact Statement, if an agreed-upon stocking rate cannot be reached, and after the issuance of a proposed decision and the filing of a protest by the allottee, the target group will be asked to again review the allotment to assist in arriving at an acceptable stocking rate.

Phase VI

Rangeland Monitoring

The target group will be convened to inform them of the intent and procedure to be used in establishing monitoring studies and their participation will be requested. The contact procedure identified in II.B. and C. will also be used to inform allottees of study establishment methods, schedules, analysis, and evaluations.

Phase VII

Documentation

A. Documentation of all contacts, whether by mail, in person, by telephone, etc., is mandatory. Documentation shall be kept in chronological order and properly filed by allotment if allotment specific or in a general file if not allotment specific.

B. During inventories or studies, the Area Manager will document pertinent information, such as who worked where, hours spent on quality control with each team, contact with the public, contact with the allottee or authorized representative, etc.

C. All documentation is available at the District or Area Office for review. Summaries of study data will be made available upon request. Detailed inventory or study data will be available for review in District or Resource Area Offices.

D. Prior to the preplanning phase, the District Manager shall contact the target group and ask them if they wish to be notified of actions by certified mail rather than regular mail. Parties that do not respond will receive all correspondence by regular mail.

Outline for Rangeland Program Summary

I. Introduction

Describe the context for the decision including the legal background for the grazing EISs, a history of grazing in the Environmental Impact Statement area, and the existing situation.

II. The Program

The Rangeland Program Summary shall summarize the land use planning objectives for all rangeland uses and shall set forth those decisions that affect livestock grazing, including for each allotment the proposed rangeland improvements and the environmental costs and benefits of the program.

The document shall also contain a proposed schedule for the issuance of decisions and describe the procedures and time available for all affected interests to express their views or take action on decisions.

The document will describe the supplemental inventories and studies necessary to reach site-specific decisions in the improve category (I) where existing information is inadequate or lacking.

III. Public Involvement

Describe the involvement from groups, individuals, and Government agencies at all levels during land use planning, preparation of the EIS, and the decision process.

IV. Action Plan

A. Administrative Actions. Describe the administrative process, including the steps and schedule for implementing the decision, i.e., grazing permits.

B. Range Improvements. Describe the number, type, and schedule for range improvement projects.

C. Related Actions. Describe the number, type, and schedule for actions such as wildlife habitat developments, watershed improvements, etc., that are related to the grazing decision and will be taken concurrently with it. This is an expansion of material described in II.A.

D. Grazing Use Adjustments. Describe the increases, decreases, and unchanged situations. Clearly state the schedule for adjustments and, where data is adequate, describe any actions that will be taken to reduce the economic impact on ranchers scheduled for reductions.

E. Appropriations. Development of range improvement facilities and grazing managemetn programs will be based on current appropriations.

F. Monitoring. Describe the specific evaluation studies and research actions that will be taken to monitor resource conditions resulting from the program decisions.

Summary Updates

I. Initial Document

This document summarizes actions proposed to achieve the land used objectives and to implement the land use planning decisions and describes the monitoring program for the area.

II. Subsequent Updates

This document shall summarize, by allotment, the progress toward achieving planning objectives, the numbers of decisions issued, number of decisions to be issued, and progress in the monitoring and rangeland improvement programs. Identify any deviations from the grazing program, as set forth in the summary document, and reasons for the deviation.

TARGET GROUP REPRESENTATIVES

1. Grazing Lessees or Permittees

2. State Land Commissioner
   P. O. Box 1148
   Santa Fe, NM 87503

3. New Mexico Department of Agriculture
   Division of Agricultural Programs and Resources
   P. O. Box 5702
   Las Cruces, NM 88003

4. Range Improvement Task Force
   NMSU Box 3 AE
   Las Cruces, NM 88003

5. All members of local grazing advisory boards.

6. All other land owners within each specific allotment.

7. Federal land managing agencies affected by or affecting grazing management on BLM allotments.

Appendix A-3

AVERAGE ECOLOGICAL CONDITION, FORAGE PRODUCTION & PLANT COMPOSITION BY RANGE SITE a/

SCS Range Site	Ecological Condition Rating b/	Total Forage Production (lbs.per ac.)	Percent Vegetation Cover	Percent Litter Cover	Percent Bare Ground	Percent Small Rock	Percent Large Rock	Range Category
Loamy CP-2	61.1	260.5	28.5	28.0	41.5	1.8	.1	Loamy
Loamy CP-3	50.1	350.8	47.7	21.5	25.4	4.2	.3	Loamy
Loamy CP-4	62.3	420.5	36.2	29.9	33.1	.7	.1	Loamy
Loamy SD-2	46.4	286.9	17.9	25.7	55.6	.9	.0	Loamy
Loamy SD-3	58.1	351.4	29.3	30.5	38.7	.8	.2	Loamy
Bottomland SD-3	60.4	615.7	25.0	42.8	32.1	.0	.1	Loamy
Salty Bottomland SD-2	47.2	548.8	26.9	51.2	22.0	.0	.0	Loamy
Salty Bottomland SD-3	47.3	222.9	22.2	34.8	43.0	.0	.0	Loamy
Salt Flats SD-3	62.3	171.6	16.8	21.6	61.6	.0	.0	Loamy
Gyp Uplands CP-2	41.1	182.8	32.0	44.0	21.0	3.0	.0	Gyp Uplands
Gyp Uplands SD-3	52.2	214.4	10.7	18.0	71.0	.1	.2	Gyp Uplands
Hills CP-3	51.7	539.7	35.7	28.9	13.1	18.9	3.4	Hills
Limestone Hills CP-3	52.2	312.5	21.1	13.2	16.9	37.1	13.3	Limestone Hills
Limestone Hills CP-4	58.3	336.1	27.6	14.5	8.2	27.5	27.0	Limestone Hills
Limestone Hills SD-2	48.6	302.4	6.9	12.3	9.0	58.0	13.7	Limestone Hills
Limestone Hills SD-3	44.4	267.0	15.8	16.0	20.5	28.1	10.7	Limestone Hills
Shallow Limestone CP-3	66.4	281.4	22.7	26.3	4.3	28.0	18.7	Limestone Hills
Very Shallow CP-4	61.9	268.7	25.8	17.9	18.3	29.0	9.0	Limestone Hills
Shallow CP-2	51.2	283.3	24.6	19.6	33.9	16.5	3.3	Limestone Hills
Shallow CP-3	51.6	269.8	29.6	21.0	27.5	16.8	4.8	Limestone Hills
Shallow CP-4	53.2	258.0	25.4	18.2	20.8	28.6	6.7	Limestone Hills
Shallow SD-3	43.9	288.0	20.0	16.8	28.4	25.9	7.2	Limestone Hills
Gravelly CP-3	52.0	330.9	41.8	14.3	22.8	20.3	.9	Limestone Hills
Gravelly SD-2	23.6	469.7	9.0	16.5	45.0	26.7	2.8	Limestone Hills
Gravelly SD-3	37.6	297.7	21.9	23.9	41.1	12.3	.8	Limestone Hills
Malpais SD-2	58.2	331.1	14.7	19.1	20.0	9.4	36.7	Malpais
Sandy SD-2	20.2	214.6	9.9	25.2	64.9	.0	.0	Sandy
Sandy SD-3	36.6	399.5	22.2	39.8	31.9	2.4	.1	Sandy
Sandy Loam CP-2	36.0	578.2	21.8	53.9	24.8	.2	.0	Sandy
Deep Sand CP-2	41.9	379.7	21.7	45.1	33.0	.2	.0	Sandy
Deep Sand SD-2	23.7	230.6	4.9	68.0	26.7	3.0	.0	Sandy
Deep Sand SD-3	46.0	361.0	7.3	25.3	67.3	.0	.0	Sandy
Shallow Sand CP-2	42.3	498.3	17.8	24.1	52.5	5.2	.3	Sandy

Source: BLM Roswell Resource Area Monitoring Files, 1982-1983

Note: a/ The figures below were derived by summing the individual transects and dividing by the number of transects within a range site.

b/ 0-25 = Poor; 26-50 = Fair; 51-75 = Good; 76-100 = Excellent

TELECOPIED: 4/29/83
Time: MDT: 1:35 pm

STATE OF NEW MEXICO

Department of Agriculture

GOVERNOR'S CABINET

TONEY ANAYA
Governor

Box 3189, NMSU Campus
Las Cruces, New Mexico 88003
Phone: (505) 646 3007

DR WILLIAM P. STEPHENS
Secretary

April 29, 1983

Mr. Phil Kirk
Roswell Resource Area Manager
Bureau of Land Management
P. O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Kirk:

This letter is to serve as official comment on the Alternative Selection of the West Roswell Management Framework Plan - Amendment (MFP-A).

We appreciate the opportunity to comment on the Alternative Selection, but feel that compliance was not maintained with Phase I, Paragraphs B and C of the New Mexico Bureau of Land Management Rangeland Consultation Policy during the preplanning phase. These sections require meetings with the target group regarding issue identification and a final copy of the summary of issues to be provided to the target group. Considerable effort was expended during the Issue Identification phase in 1981, yet the results were not known until March 30. 1983 at your public meeting.

During the March 30, 1983 meeting, we were informed the process was to be a Resource Management Plan, as opposed to a MFP-A and the difference was spelled out in a handout. Since that time, it appears the process has been changed to an MFP-A. We do not understand the rationale for this change. Further information on this apparent change would be appreciated.

In regard to the actual issue chosen, Mr. Jerry Townsend of the BLM State Office indicated the MFP-A might discuss other issues such as livestock fence modifications for wildlife. These types of situations do not, in our opinion, track with the identified issue of Forage Allocation To Livestock as presented in the March 30, 1983 meeting and should not be included in the MFP-A.

Regardless of the planning process chosen, the analysis of livestock forage allocation apparently will be a primary issue in the Environmental Impact Statement (EIS). Toward that end, we recommend the inclusion of a fourth

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alternative as proposed in Attachment 1. We believe this alternative best reflects the direction of the Bureau and the special needs of the area. Full evaluation in the EIS will provide the flexibility in the decision-making process to proceed with sound range management programs as provided in current BLM policies.

Sincerely,

William P. Stephens

WPS/mb

Enclosure: Attachment I-1--Alternative Four

Attachment I-1

ALTERNATIVE FOUR - FOCUS MANAGEMENT ON EXISTING RANGELAND POLICIES

ALLOTMENTS CATAGORIZED BY THE ROSWELL DISTRICT GRAZING ADVISORY BOARD CRITERIA AS DIRECTED BY THE LIVESTOCK GRAZING MANAGEMENT POLICY

ALLOTMENTS GROUPED INTO THREE CATEGORIES

CATEGORY M

- RANGE CONDITION SATISFACTORY
- NO BUREAU PROPOSED CHANGES IN MANAGEMENT
- CONTINUE NON-INTENSIVE MONITORING STUDIES
- HIGH PRIORITY FOR PRIVATE (SECTION 4) RANGE IMPROVEMENTS

CATEGORY I

- HIGH POTENTIAL FOR RANGE CONDITION IMPROVEMENT
- EMPHASIZE RANGE IMPROVEMENT PLANS BY PRIORITY
- HIGH PRIORITY FOR PRIVATE AND BLM RANGE IMPROVEMENTS
- CONTINUE MONITORING STUDIES

CATEGORY C

- ALLOTMENTS WITH INSIGNIFICANT AMOUNTS OF PUBLIC LANDS
- NO BUREAU PROPOSED CHANGES IN MANAGEMENT
- NO MONITORING STUDIES
- HIGH PRIORITY FOR PRIVATE (SECTION 4) RANGE IMPROVEMENTS

JUSTIFICATION

The West Roswell Resource Area is a prime example of successful range management by BLM allottees. Present condition, by the BLM assessment, is good with 75 percent of the allotments in mid-fair ecological range condition or better. Average licensed use for the past 5 years has been 95 percent of preference, the highest known percentage in any BLM area its size in the state. Bureau findings document a high diversity of wildlife species as well.

This situation is primarily a result of the successful management by BLM allottees and the range improvements constructed by them with private funds. This illustrates that flexibility allowed the allottee by the BLM and private investment in range improvements result in the high productivity for both livestock grazing and wildlife.

Attachment I-2

Present policies and regulations of the BLM encourage such private investments and allow for maximum flexibility for allottees, while protecting and enhancing the natural resources. A program designed for management of livestock grazing under these policies and regulations will further the exemplary situation which already exists in the West Roswell Resource Area.

DESCRIPTIVE NARRATIVE

Alternative 4 emphasizes management efforts under current policies and regulations that exist within the Bureau of Land Management. Examples of these policies and regulations are the Livestock Grazing Management Policy, Rangeland Improvement Policy, New Mexico BLM Rangeland Consultation Policy and the Grazing Administration Regulations.

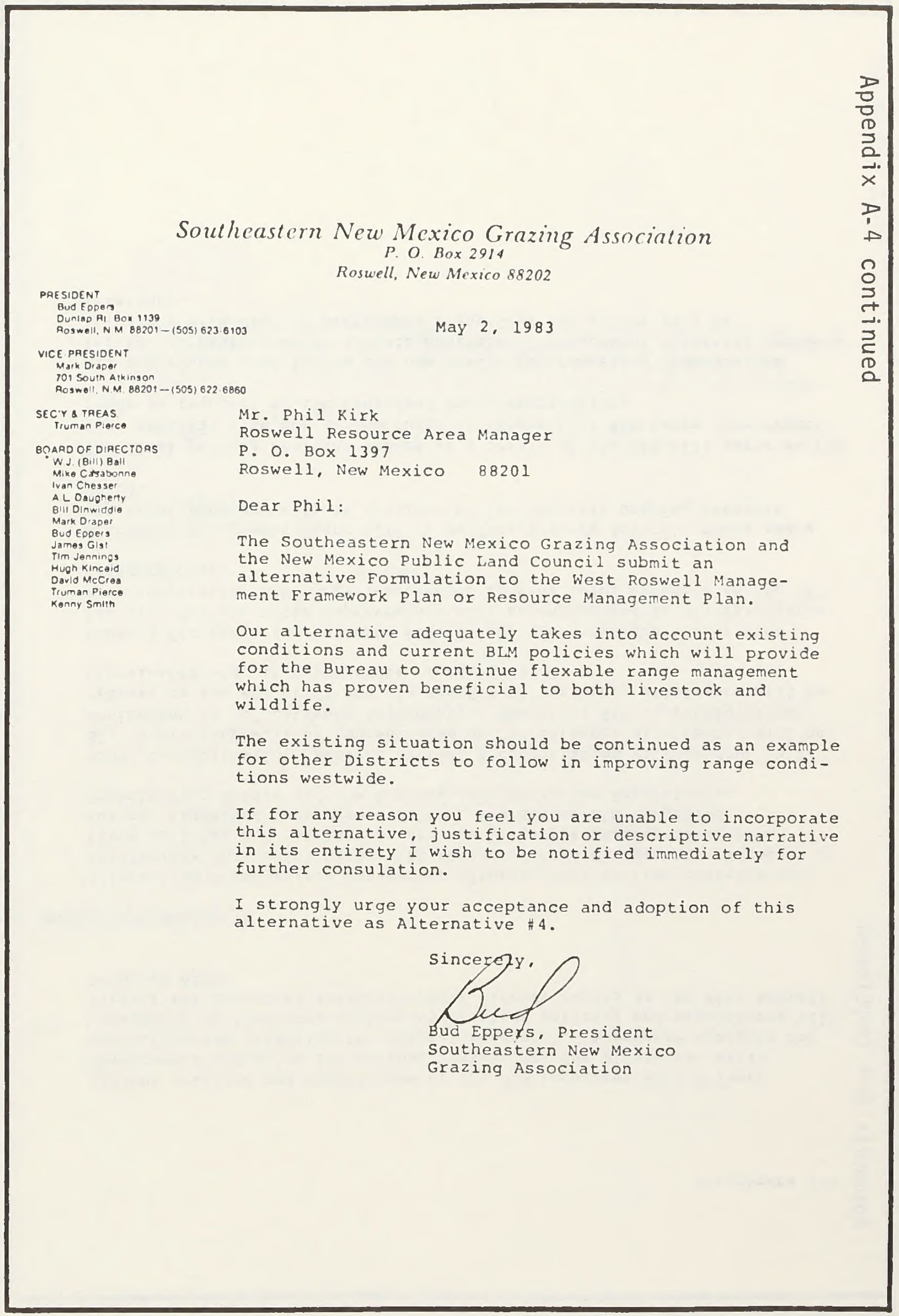
Final categorization, pending Section 8 consultation will be done in FY 83. Monitoring will be concentrated on "I" category allotments, with no monitoring on "C" category allotments. The final EIS is scheduled for release by the end of FY 84. In the EIS "I" category allotments will be reevaluated and, if appropriate, recategorized.

Funding for range improvements will follow the Rangeland Improvement Policy. Private range improvements will be encouraged in all categories, with cooperative BLM range improvement funding being expended in the "I" category only.

Allotment Management Plans will be evaluated every five (5) years and a report of progress will be provided to the District Grazing Advisory Board.

The final grazing decision issued as a result of the EIS will serve as the site specific plan for expenditures of cooperative BLM range improvement funds as required by the Rangeland Improvement Policy.

All procedures will follow the New Mexico BLM Rangeland Consultation Policy. A reissuance of a draft Analysis of Management Situation Document to comply with Phase I paragraphs B and C of the policy will be necessary.



Southeastern New Mexico Grazing Association
P. O. Box 2914
Roswell, New Mexico 88202

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Bud Eppers
Dunlap Rt. Box 1139
Roswell, N.M. 88201—(505) 623-6103

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Kenny Smith

May 2, 1983

Mr. Phil Kirk
Roswell Resource Area Manager
P. O. Box 1397
Roswell, New Mexico 88201

Dear Phil:

The Southeastern New Mexico Grazing Association and the New Mexico Public Land Council submit an alternative Formulation to the West Roswell Management Framework Plan or Resource Management Plan.

Our alternative adequately takes into account existing conditions and current BLM policies which will provide for the Bureau to continue flexable range management which has proven beneficial to both livestock and wildlife.

The existing situation should be continued as an example for other Districts to follow in improving range conditions westwide.

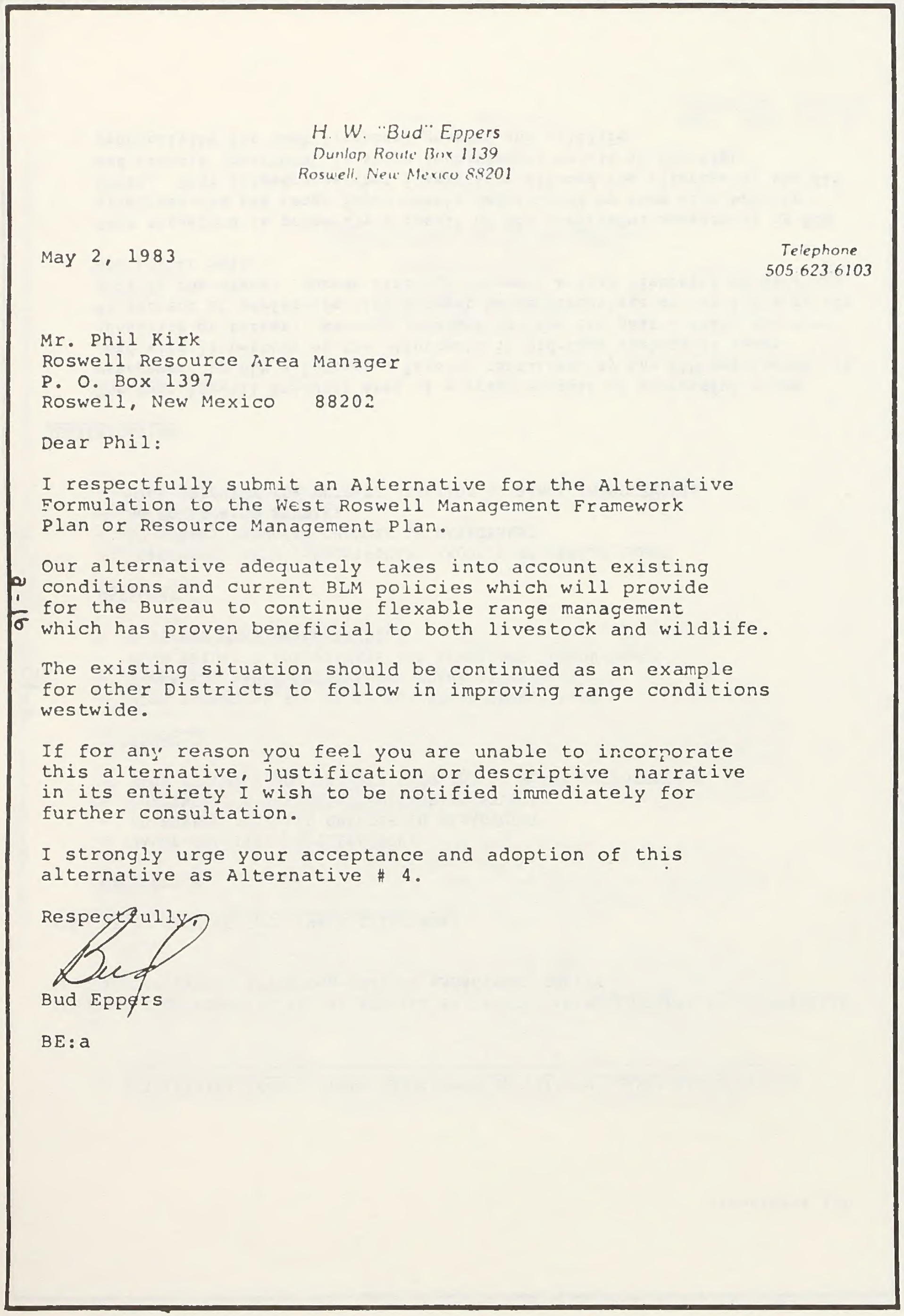
If for any reason you feel you are unable to incorporate this alternative, justification or descriptive narrative in its entirety I wish to be notified immediately for further consulation.

I strongly urge your acceptance and adoption of this alternative as Alternative #4.

Sincerely,

Bud

Bud Eppers, President
Southeastern New Mexico
Grazing Association



H. W. "Bud" Eppers
Dunlap Route Box 1139
Roswell, New Mexico 88201

Telephone
505 623 6103

May 2, 1983

Mr. Phil Kirk
Roswell Resource Area Manager
P. O. Box 1397
Roswell, New Mexico 88202

Dear Phil:

I respectfully submit an Alternative for the Alternative Formulation to the West Roswell Management Framework Plan or Resource Management Plan.

Our alternative adequately takes into account existing conditions and current BLM policies which will provide for the Bureau to continue flexable range management which has proven beneficial to both livestock and wildlife.

The existing situation should be continued as an example for other Districts to follow in improving range conditions westwide.

If for any reason you feel you are unable to incorporate this alternative, justification or descriptive narrative in its entirety I wish to be notified immediately for further consultation.

I strongly urge your acceptance and adoption of this alternative as Alternative # 4.

Respectfully,

Bud

Bud Eppers

BE:a

JUSTIFICATION

The West Roswell Resource Area is a prime example of successful range management by BLM allotees. Present condition, by the BLM assesment, is good with 75% if the allotments in mid-fair ecological range condition or better. Average licensed use for the past 5 years has been 95% of preferance, the highest known percentage in any BLM area its size in the state. Bureau findings document a high diversity of wildlife species as well.

This situation is a result of the successful management by BLM allotees and the range improvements constructed by them with private funds. This illustrates that flexibility allowed the allottee by the BLM and private investment in range improvements result in the high productivity for both livestock grazing and wildlife.

Present policies and regulations of the BLM encourage such private investments and allow for maximum flexibility for allottees, while protecting and enhansing the natural resources. A program designed for management of livestock grazing under these policies and regulation will further the exemplary situation which already exists in the West Roswell Resource Area.

DESCRIPTIVE NARATIVE

Current policies and regulations exist within the Bureau of Land Management and Alternative 4 emphisizes management efforts under these. Examples of these policies and regulation are the Livestock Grazing Management Policy, Rangeland Improvement Policy, New Mexico BLM Rangeland Consulation Policy and the Grazing Administration Regulations.

Final categorization, pending Section 8 consultation will be done in FY 83. Monitoring will be concentrated on "I" category allotments, with no monitoring on "C" category allotments, The final EIS is scheduled for release by the end of FY 84. In the EIS "I" category allotments will be re-evaluated and, if appropriate, re-categorized.

Funding for range improvements will follow the Rangeland Improvement Policy. Private range improvements will be encouraged in all categories, with cooperative BLM range improvement funding being expended in the "I" category only.

Allotment Management Plans (AMPs) or Cooperative Management Plans (CMPs) will be evaluated every five (5) years and a report of progress be given to the District Grazing Advisory Board.

The final grazing decision issued as a result of the EIS will serve as the site specific plan for expenditures of cooperative BLM range improvement funds as required by the Rangeland Improvement Policy.

All procedures will follow the New Mexico BLM rangeland Consultation Policy a re-issuance of a draft Analysis of Management Situation document to comply with Phase I paragraphs B and C of the policy will be necessary.

APPENDIX B

LIVESTOCK GRAZING

APPENDIX B-1

"I" CATEGORY ALLOTMENTS/USE/CONDITION

Allot. Number	Operator Name	Original Adjudicated Preference (AUMs)	5-Year Average Licensed Use (AUMs)	Federal Acres by Condition Class [a] High-Fair/ Better	Low-Fair/ Less	Apparent Trend [d]
2067	Van Eaton, Fred	624	624	1440	520	+
2070	Glass, David	1476	1476	5860	0	+
2071	Key, Melvin R. [b]	1968	1968	6842	0	+
3015	Merritt, Ronald	1560	1532	2880	1418	+
3019	Townsend, Henry	1320	1320	5136	2040	+
3021	Lovelace, J.R. Cattle Co. [c]	3984	3984	18015	0	+
3034	Corn, W.H. & W.E.	5111	4394	24208	4200	+
3039	Rogers, Robert A.	2628	2140	7881	1960	S
3048	Corn, Mike	848	815	1885	2260	+
3049	Marley Ranches Ltd.	1728	1722	6368	0	+
3053	Shanks Bros. Ltd.	1248	1248	4617	0	+
3074	McDonald, Laura	1314	1050	1840	10290	S
3075	Picture-Cook	364	185	3695	1500	S
3077	Johnson, Carl L.	2784	2756	14336	1260	+
3079	Stephenson Ranch	696	685	2980	5367	S
3081	Withers Ranch	179	179	0	2515	S
4001	Corn, Herbert	1575	1085	2775	2080	+
4003	Miles-Langenegger	3195	2714	8346	4300	+
4019	Stevenson, C.A. & Max	4240	2497	13509	0	+
4021	Corn, Bronson	1714	1714	5979	2240	+
4022	Corn, Poe Est.	301	150	1280	0	+
4023	Corn, Herbert	657	285	3150	0	+
4025	Armstrong, Robert	3519	2505	11202	3680	+
4028	Corn, Mike	1458	1458	6740	0	+
4030	Draper, Mark	1848	1789	6001	0	+

Appendix B-1 (continued)

"I" CATEGORY ALLOTMENTS/USE/CONDITION

Allot. Number	Operator Name	Original Adjudicated Preference (AUMs)	5-Year Average Licensed Use (AUMs)	Federal Acres by Condition Class a/ High-Fair/ Better	Federal Acres by Condition Class a/ Low-Fair/ Less	Apparent Trend d/
4032	Sacra, Glaze	960	960	3699	0	+
4038	Winn, Madison	1236	1236	320	6110	+
4039	Ewart, James	912	912	2660	1480	+
4040	Benedict, E.N.	1373	1121	4120	3183	+
4046	Cooper, Thomas	1673	1672	9947	0	+
4049	Spool Cattle Co.	2088	2223	7558	4360	+
4050	Atkins, Hubert	644	644	3655	1120	+
4051	Spurrier	1083	895	4716	0	+
4056	Atkins, Hubert	360	360	2680	1380	+
4067	Chesser Ranch, Inc.	1643	1643	320	5514	+
4073	McCall	1510	1510	4541	2160	+
4076	Casarez, Rosendo	320	280	0	1560	S
4079	Fenmet Co.	1351	1351	1000	5815	+
	Total	61492	55082	212181	78312	

a/ Estimates of Condition Class based on the results of first year monitoring.

b / c / Following BLM/operator consultation, allotments in satisfactory range condition were subsequently placed in "M" category

d/ Apparent Trend: + Upward; S Static

Appendix B-2

"M" CATEGORY ALLOTMENTS/USE/CONDITION

Allot. Number	Operator Name	Original Adjudicated Preference (AUMs)	5-Year Average Licensed Use (AUMs)	Federal Acres by Condition Class a/		Apparent Trend d/
				High- Fair/ Better	Low-Fair/ Less	
2034	Perez, Ramon	1523	1523	4740	800	+
2049	Taylor, Bennie	1595	1595	5960	0	+
2050	Burquette Brothers	5184	5184	16662	2280	+
2072	Key, Wm. Jr.	1104	1104	4499	0	+
3004	Nalda, John	780	780	2800	0	+
3011	Connell (Hays)	1872	1872	5480	2240	+
3011	Connell (Byrd)	930	930	2399	0	+
3012	Diamond L	1980	1980	6986	0	+
3016	Dunlap, Tom	2242	2236	8354	0	+
3017	McKnight, J. P.	2157	1999	7677	0	+
3018	Reynolds Ranches Co.	1740	1728	6586	0	+
3020	X-Bar Ranch	12465	12465	45457	2260	+
3029	Kelly, Kap	1413	1413	4288	0	+
3030	Hendricks, Wilda	2892	2892	10467	0	+
3032	Marley, Clyde & Robert	2636	1919	9271	0	S
3033	McKnight Sheep	1304	1267	4543	0	+
3035	Circle F Ranch	5806	4554	18126	2720	+
3036	Connell, Alvin	3740	3577	13516	0	+
3037	Richards, C. H.	3417	3210	10552	0	+
3041	McInnes, Willie	1729	1611	6112	0	+
3042	McNally, Inc.	2260	1946	8367	0	+
3046	Kelly, Kap	2494	1938	9366	0	+
3047	Arroyo Seco	1096	1359	3841	0	+
3058	Riley, Broier	840	840	2818	0	+
3059	Nunez, R. C.	540	540	1776	0	+
3061	White, Phelps	1596	1596	4836	0	+
3062	Corn, James	2200	2196	6073	0	+

Appendix B-2 (Continued)

"M" CATEGORY ALLOTMENTS/USE/CONDITION

Allot. Number	Operator Name	Original Adjudicated Preference (AUMs)	5-Year Average Licensed Use (AUMs)	Federal Acres by Condition Class a/ High- Fair/ Better	Low-Fair/ Less	Apparent Trend d/
3063	Carruthers Ranch	1857	1857	5460	0	+
3064	Carruthers Ranch	1255	1557	3702	0	+
3065	McKnight, Douglas	528	528	1963	0	+
3067	Merritt, Ronald	287	287	958	0	+
3072	Marley Ranches, Ltd.	576	576	2119	0	+
3076	Shrecengost, Bill a/	2467	1575	11513	0	+
3078	McBrayer, A. J.	12	12	268	0	+
3080	Bar W Ranch, Inc.	264	264	4725	0	+
3097	Jackson, Sara	480	480	2280	0	+
3100	Roadrunner Ranches	734	1478	3962	0	+
3101	Block Dot	3556	3012	8341	0	+
4002	Gunter, Roy Jr.	3694	3080	11469	0	+
4004	Martin, Sterling	1368	1368	6023	0	+
4006	Martin, Jerry Don	684	684	2987	0	+
4007	Miller, Bertha C.	1743	1726	6860	0	+
4008	Sacra Minerals, Inc.	1966	1787	6377	880	+
4009	Corn Bros. Trust	852	852	3248	0	+
4010	McKnight, W. D.	456	1048	1750	0	+
4011	McKnight, W. D.	1482	1482	4784	0	+
4012	McKnight, W. D.	869	865	3276	0	+
4013	Eppers, H. W., Jr.	1867	1867	7091	0	+
4015	Pierce, Truman	1500	1263	4469	0	+
4016	Pierce, Truman	3402	2064	11905	0	+
4017	Corn, Irwin	1728	1268	5288	0	+
4018	Kelly, Kap	1417	585	4095	0	+
4020	Corn, Tom	2354	1842	10223	0	+
4026	Corn, Fred B. & Sons (home)	5189	4722	16623	0	+

Appendix B-2 (continued)

"M" CATEGORY ALLOTMENTS/USE/CONDITION

Allot. Number	Operator Name	Original Adjudicated Preference (AUMs)	5-Year Average Licensed Use (AUMs)	Federal Acres by Condition Class a/ High-Fair/ Better	Low-Fair/ Less	Apparent Trend d/
4026	Corn, Fred B. & Sons(Miller)	421	383	2042	0	+
4029	Childress Ranch, Inc.	2366	2154	7449	0	+
4031	Draper, Mark	2145	2171	6543	0	+
4033	Marley, Wm.	1167	1167	5106	0	+
4037	Marley, Clyde & Whitney	5983	4259	18514	1300	+
4041	Corn, Ruth	2153	2153	10686	0	+
4042	Daniels, J. W. Est.	843	843	3920	0	+
4043	Daniels, J. W. Est.	651	639	2860	0	+
4044	Corn, Bronson	1198	1198	6061	0	+
4045	Corn, Bronson	555	555	3331	0	+
4048	Diamond A Cattle Co.	108	108	530	0	S
4053	Cliett, James	975	975	4535	0	+
4054	Wagner, Charles	108	103	350	0	+
4055	McLain, Ella	480	105	1520	0	+
4057	Lynch, Gary	422	479	1638	0	+
4060	MX Ranch	4201	3736	16780	0	+
4061	Gist, Fred M.	4521	4006	14278	2580	+
4062	Henderson, Matthew	1275	967	3984	0	+
4064	Brown, Byron L.	480	450	2660	0	+
4065	Johnson, S.P., Jr.	1722	1014	7556	0	+
4066	North Diamond A	5085	4517	17109	2000	+
4066	South Diamond A	6270	4860	22313	0	+
4068	Townsend Land & Cattle	1277	1508	4632	680	+
4069	Hunt, Clay	432	432	1905	0	+
4070	Sacra Minerals, Inc. c /	600		2293	0	+

Appendix B-2 (continued)

"M" CATEGORY ALLOTMENTS/USE/CONDITION

Allot. Number	Operator Name	Original Adjudicated Preference (AUMs)	5-Year Average Licensed Use (AUMs)	Federal Acres by Condition Class a/ High-Fair/ Better	Federal Acres by Condition Class a/ Low-Fair/ Less	Apparent Trend d/
4075	Hnulik, Ellis	336	336	1617	0	+
4080	Hunt, Clay	515	441	2517	0	+
4082	Jackson, Carrol Est.	675	675	3396	0	-
4084	Sacra, Glaze	879	879	3129	0	+
4085	Moats, Betty	710	710	2547	0	+
0000	Ft. Stanton	6000	6000	26000	0	+
	Total	164,675	150,206	593,352	15,900	

a/ Estimates of condition class based on the results of first year monitoring.

b/ Following BLM/operator consultation, allottee elected to be placed in "I" category.

c/ Allotment #4010 has since been divided into two allotments - #s 4010 and 4070; 5-year average licensed use is reflected in #4010 only.

d/ Apparent trend: + Upward; - Downward; S Static.

APPENDIX B-3

CUSTODIAL ("C") CATEGORY ALLOTMENTS

Allot. No.	Name	Original Adjudicated Preference(AUM's)	5-Year Average Licensed Use(AUM's)	Federal Acres Condition Class Undetermined a/
1001	Smith, Frank J.	30	30	120
1002	Davis, H.H.	3	3	34
1003	Woody Acres, Inc.	120	120	640
1004	Adams, Clarence	23	23	80
1005	Tucker, Thomas	165	165	880
1006	Perschbacher, J. A.	60	60	320
1007	Fuller, Ben	60	60	320
1008	Finus Tucker Trust	515	515	2831
2001	Lucero, Benerito	7	7	40
2002	Sanchez, Abelino	17	17	86
2003	Metcalf, L.E.	75	75	268
2004	Thompson, Melville	12	12	40
2005	Chaves, Manuel	8	8	80
2006	Sanchez, Felipe Jr.	38	38	200
2007	Sena, Martin	34	34	360
2008	Reilly Ltd.	160	160	714
2009	Hornsby Land & Cattle	285	285	1520
2010	Hicks, John L.	23	23	80
2011	Bedford, H.G.	20	20	120
2012	Avant, Alma	68	68	240
2013	Whipple, Ray A.	68	68	200
2014	Peacock, Ruben	4	4	20
2015	Willaims, S.S.	30	30	120
2016	Northcutt, Elmer	32	32	120
2017	Killough, Alan	80	80	240
2018	Pendery, Mrs. Clinton	60	60	320
2019	J.P. Gibbons Trust	12	12	80

Appendix B-3 (continued)

Allot. No.	Name	Original Adjudicated Preference(AUM's)	5-Year Average Licensed Use(AUM's)	Federal Acres Condition Class Undetermined a/
2020	Flores, Alfredo	100	100	557
2021	Chavez, Jose	52	52	279
2022	Padilla, Jose	8	8	40
2023	Z R Hereford Ranch	45	45	120
2024	White, Joe	2	2	40
2025	Lopez, Julian	65	65	480
2026	Sanchez, Alfredo	6	6	80
2027	Saiz, Luis	8	8	40
2028	Campos, Pelagio	15	15	80
2029	Ariaz, Arturo	6	6	40
2030	Martinez, Solomon	20	20	80
2031	Johnson, W.F. Est.	240	240	780
2032	Garcia, Jose Est.	120	120	413
2033	B.A. Johnson Est.	360	360	1716
2035	Campos, Emerenciano	320	320	1120
2036	Pastura Ranch	240	240	715
2037	Tapia, Arturo	84	84	440
2038	Tapia, Edmundo	106	106	567
2039	Tapia, Placido	45	45	242
2040	Pittman, Bobby	54	54	240
2041	Thompson, M.G.	9	9	40
2042	Blakely, Bill	324	324	1280
2043	Gates, Albert	25	25	120
2044	Perez, Eugene	15	15	80
2045	Perez, Eugene	144	144	600
2046	Horney, Zola	324	324	1330
2047	Hindi Sheep & Cattle	960	960	3438
2048	Cordova, Amelia	29	29	120
2051	Vaughn Enterprises	720	720	2520
2052	Byrd, Bob	12	12	40

Appendix B-3 (continued)

Allot. No.	Name	Original Adjudicated Preference (AUMs)	5-Year Average Licensed Use (AUMs)	Federal Acres Condition Undetermined a/
2053	Good Ranch Trust	540	540	1900
2054	Overton, Tyne E.	804	804	3600
2055	McCabe, Silas	144	144	517
2056	Smith, A.D.	24	24	65
2057	Morris, Leon	30	30	160
2058	Newton, Doyle	235	235	1240
2059	Horney, Zola G.	24	24	80
2060	Mitchell, Tom	420	420	1481
2061	El Yeso Ranch Co.	576	576	2003
2062	Dean, Charles & Betty	80	80	320
2063	Dean, Charles & Betty	30	30	120
2064	Dean, Charles & Betty	264	264	905
2065	S Bar J Ranch, Inc.	13	13	80
2066	Leftwich, J.R. Est.	60	60	200
2068	Key, Marvin et al	24	24	80
2069	Key, Marvin	312	312	1196
2073	Sanchez, Arsenio	65	65	362
2074	Brassell Brothers	44	44	240
2075	Diamond L, Inc.	456	456	1520
2076	Key, Marvin etal	59	59	200
2077	Anderson, Michael	260	260	1178
2078	Perez, Raymond	36	36	120
2079	Rafter X, Inc.	9	9	80
2080	Powell and Ryan	240	240	800
2081	Hisel, Don L.	26	26	80
2082	Z R Hereford Ranch	25	25	160
2083	Catese, Joe	8	8	75
2084	Tapia, Erlindo	51	51	246
2085	Page & Webb Land	33	33	175
2086	Ramon Perez Ranch, Inc.	72	72	302

Appendix B-3 (continued)

Allot. No.	Name	Original Adjudicated Preference(AUM's)	5-Year Average Licensed Use(AUM's)	Federal Acres Condition Class Undetermined a/
3001	Davidson, Jack Jr.	45	45	240
3002	Orndorff, Will	56	56	200
3003	Elliott, Helen	720	720	2596
3005	Byrd, Sudlena O.	540	540	1960
3006	Sultemeier, Frank W.	420	420	1629
3007	Sultemeier, Clint	48	48	160
3008	Washburn, Lorena W.	348	348	1500
3009	Proctor, Floyd	140	140	560
3010	Sultemeier, Clint	240	240	800
3013	Parker-Townsend	140	140	467
3014	Merritt, J.L.	168	168	600
3022	Hall-Gnatkowski Inc.	135	135	720
3023	Harkey, Jack N.	52	52	278
3024	McCarty, William G.	28	28	99
3025	Eldridge, Grady	492	492	1948
3026	Edgar, William J.	24	24	80
3027	Lietzman, Robert W	24	24	80
3028	Davis, A.E., Jr.	930	930	4192
3031	Armstrong, G.G.	36	36	160
3038	Liakos, William G.	351	351	1370
3040	Yriart, Robert M.	816	816	2670
3043	Eppers, H.W. Jr.	408	408	1520
3044	T-75 Ranch, Inc.	252	252	900
3045	Fresquez, Lutario	216	216	800
3050	Bird Ranch	276	276	1038
3051	Sisneros, George	216	216	800
3052	McTeigue, Jimmy	108	108	400
3054	Studdard, Jack	12	12	30
3055	Cooper, Joyce	312	312	1146
3056	Sisneros, George	108	108	395

Appendix B-3 (continued)

Allot. No.	Name	Original Adjudicated Preference(AUM's)	5-Year Average Licensed Use(AUM's)	Federal Acres Condition Class Undetermined a/
3057	Pacheco, L.A.	12	12	40
3060	Nunez, R.C.	60	60	282
3066	McKnight, Joe W.	396	396	1383
3068	Mendiola, Peter	156	156	562
3069	Salas, Danny	12	12	40
3070	Gutierrez, Annie Est.	8	8	40
3071	Slayton, Paul	15	15	80
3073	Gomez, Marie	60	60	213
3082	Helms, A.D.	108	108	830
3083	Sidwell, G.B.	12	12	80
3084	Bond, E.T. Dimmitt	84	84	320
3085	Thorton Ranch, Inc.	36	36	440
3086	Crenshaw, Robert	12	12	42
3087	Erramouspe, Inc.	96	96	560
3088	Gnatkowski, A.W.	24	24	120
3089	Harkey, Howard	12	12	34
3090	Harkney, Jack N.	96	96	560
3091	Hightower Land & Cattle	804	804	2040
3092	Knight, Thomas	120	120	560
3093	Roller, Grace	12	12	40
3094	Stephenson Ranch	12	12	40
3095	Hall-Gnatkowski	36	36	120
3096	Bar W Ranch	12	12	40
3511	Sawyer, Fern	6	6	50
3522	Jones, Preston	1	1	5
4005	Martin, Sterling "Home"	180	180	633
4014	McDaniel, W.W. Est.	96	96	320
4024	Salt Creek Farm	36	36	177
4027	Ball, William J.	548	548	1611
4034	Henry, Clifford C.	36	36	160

Appendix B-3 (continued)

Allot. No.	Name	Original Adjudicated Preference(AUM's)	5-Year Average Licensed Use(AUM's)	Federal Acres Condition Class Undetermined a/
4035	Glenn, William E.	12	12	40
4036	Armstrong, Robert	24	24	210
4047	Cooper, Thomas S.	36	36	198
4052	Mooney, F. Olin	24	24	160
4058	Blackwell, E. Clyde	48	48	200
4059	Lynch, Gary	108	108	400
4063	Brown, RC & BL	216	216	1129
4071	Jack Price Est.	24	24	80
4074	Teel, Fred	132	132	693
4077	Brady, W.H. Mrs.	141	141	640
4078	McCam, Mike	72	72	320
4081	Wormer, Paul E.	36	36	160
4083	Wilson, Charles P.	192	192	880
4086	FenMet Co.	132	132	561
4087	Wilson, Charles	12	12	40
	Total	23368	23368	93666

a/ Apparent trend is not known.

APPENDIX B-4

"I" CATEGORY ALLOTMENTS/EAST CHAVES MFP

Allot. Number	Operator Name	Federal Acres	Condition	Apparent Trend a/
5014	McDowell, Abner	1,890	Fair	-
5018	Cooper, Tom	4,613	Fair	+
5020	Durham, Bill	3,584	Fair	-
5025	Marley, Robert	4,798	Fair	-
5036	Cooper, Carl	3,111	Fair	+
5038	Graham, Lyman	1,590	Fair	-
5043	Sand Ranch	8,395	Fair	+
5044	Isler, Wilfred	1,361	Fair	-
5046	Caprock	9,823	Fair	-
5049	Clemmons & Erdmann	5,428	Fair	+
5051	Marley, Robert	17,752	Fair	-
5053	Pearce, Roy	17,682	Fair	+
5063	Culp, Julia et al	2,944	Fair	+
5065	Graham, Andrew	6,124	Fair	-
5066	Spears, J. D. & Raymond	2,520	Poor	S
5068	Malmstrom, Orville	13,723	Fair	-
5073	Derrick, Millard	2,956	Fair	-
5074	Barbe, Madeline	7,293	Fair	+
5075	Bogle, Bill	230,502		
	River	(56,950)	Good	S
	Millman		Fair	+
	Vest Camp		Fair	-
	Double Well		Fair	+
	Pipeline		Fair	-
5079	S & S	2,557	Fair	-
5082	Gomez, Gilbert	789	Fair	-
5084	Greenwood, George	8,149	Good	S
5085	Taylor & Medlin	5,704	Fair	+
5090	Sams & Dean	3,137	Fair	-
5091	Bell, Joe	6,290	Good	S

a/ Apparent Trend: + Upward; - Downward; S Static

Appendix B-4 (continued)

"M" Category Allotments/East Chaves MFP

Allot. Number	Operator Name	Federal Acres	Condition	Apparent Trend a/
5005	Denton, Ed	6,221	Fair	+
5007	Cooper, Mark	2,876	Fair	+
5010	Moorhead, Sam	2,478	Fair	+
5012	Moorhead, Sam	3,801	Fair	+
5019	Cooper, Mark	3,597	Fair	+
5021	Wagner, Charles	3,786	Fair	+
5028	Nuckols, Dillard	6,830	Fair	-
5029	McCombs, Emitt	2,931	Fair	-
5032	Davis Tom	8,479	Fair	-
5034	Seeligson-White Lakes	12,922	Good	S
5037	McCrea, David	13,897	Good	S
5039	Byrd, George	1,590	Fair	+
5041	Lassiter & Souther	635	Fair	+
5047	Hillburn, Ray	2,250	Fair	+
5057	McCrea, Joel	1,224	Good	S
5058	Sorenson, David	3,125	Good	S
5062	Garnsey, Elmer	4,273	Good	S
5069	Hill, Bill	11,110	Good	S
5072	Watson, Willard	8,679	Good	S
5077	Williams, Larry	18,828	Fair	+
5078	Slash ML	6,054	Fair	+
5092	Merritt, William	5,214	Good	S
5094	Brittain, Otto	5,519	Good	S
		136,319		

548,352 TOTAL

Apparent Trend: + Upward; - Downward; S Static

Appendix B-4 (continued)

"C" CATEGORY ALLOTMENTS/EAST CHAVES MFP

Allot. Number	Operator Name	Condition a/	Public Lands Acreage
5001	Sea Cattle		3,300
5002	Gainer, T.		350
5003	N. Plains Land & Inv.		120
5004	Boone, P.		3,060
5006	Van Eaton, F.		160
5008	Van Eaton, F.	42.0	2,342
5009	Marley, W.		2,930
5011	Moorhead, S.		1,882
5013	Goods Inc.		2,061
5014	McDowell, A. (East)		160
5015	Southard, F.		160
5016	Southard, J.		1,370
5017	Southard, J.		320
5022	Smith, H.		400
5023	White,C. L.	44.2	1,033
5026	Faircloth, E.		917
5027	Seeligson, Frates	50.4	737
5030	Jenkins, M.		320
5031	Huston		951
5033	Cato		690
5035	White Lakes		954
5039	Byrd, G.		80
5039	Byrd, G.		400
5042	Glenn, A.		640
5045	Caprock Ranch		1,440
5050	Clemmons & Erdmann		1,730
5052	Marley, W.		40
5054	Townsend, G.		390
5056	Graham, Lillian		354

Appendix B-4 (continued)

"C" CATEGORY ALLOTMENTS/EAST CHAVES MFP

Allot. Number	Operator Name	Condition a/	Public Lands Acreage
5059	Wilson, C.		1,032
5060	Salee		226
5061	Seeligson, F.	55.7	340
5064	Lee, B.		880
5070	Miles, L.		430
5071	Glass		80
5080	Greer		987
5088	Merritt, William	61.0	1,698
5089	Medlin, B.		400
5093	Haley		96
			35,460

a/ Condition undetermined except where noted.

APPENDIX B-5
ESTIMATED LONG-TERM STOCKING RATES

Allotment	Allotment Category	PA AUMs	DPA AUMs	IPA AUMs	ELG AUMs	MAX AUMs	DLG AUMs
2034	M	1,523	1,523	1,523	0	1,785	1,403
2049	M	1,595	1,595	1,595	0	1,818	1,419
2050	M	5,184	5,184	5,184	0	6,236	3,460
2067	I	624	708	684	0	795	377
2070	I	1,476	2,604	2,604	0	2,811	1,395
2071	M	1,968	2,052	2,052	0	2,216	1,629
2072	M	1,104	1,104	1,104	0	1,301	1,071
3004	M	780	780	780	0	934	534
* 3011	M	1,872	1,872	1,872	0	2,314	1,502
* 3011	M	930	930	930	0	1,078	571
3012	M	1,980	1,980	1,980	0	2,490	974
3015	I	1,532	1,661	1,532	0	1,960	521
3016	M	2,236	2,236	2,236	0	2,876	1,118
3017	M	1,999	1,999	1,999	0	2,279	1,828
3018	M	1,728	1,728	1,728	0	1,970	1,568
3019	I	1,320	1,753	1,501	0	1,938	886
3020	M	12,465	12,465	12,465	0	1,4753	10,144
3021	M	3,984	4,969	4,250	0	5,527	2,161
3029	M	1,413	1,413	1,413	0	1,995	1,021
3030	M	2,892	2,892	2,892	0	3,341	2,363
3032	M	1,919	1,919	1,919	0	2,545	1,919
3033	M	1,267	1,267	1,267	0	1,444	1,082
3034	I	4,394	6,666	5,340	0	7,379	2,673
* 3035	M	4,554	4,554	4,554	0	6,030	4,229
3036	M	3,577	3,577	3,577	0	4,171	2,990
3037	M	3,210	3,210	3,210	0	3,677	2,512
3039	I	2,140	2,810	2,321	0	3,110	819
3041	M	1,611	1,611	1,611	0	1,920	1,611
3042	M	1,946	1,946	1,946	0	2,408	1,430
3046	M	1,938	1,938	1,938	0	2,703	822
3047	M	1,359	1,359	1,359	0	1,637	692
* 3048	I	815	1,014	815	0	1,128	313
3049	I	1,722	1,902	1,843	0	2,143	1,342
3053	I	1,248	1,342	1,281	0	1,517	921

Appendix B-5 (continued)

ESTIMATED LONG-TERM STOCKING RATES

Allotment	Allotment Category	PA AUMs	DPA AUMs	IPA AUMs	ELG AUMs	MAX AUMs	DLG AUMs
3058	M	840	840	840	0	1,070	337
3059	M	540	540	540	0	678	294
3061	M	1,596	1,596	1,596	0	1,849	1,150
3062	M	2,196	2,196	2,196	0	2,520	1,642
3063	M	1,857	1,857	1,857	0	2,189	1,141
3064	M	1,557	1,557	1,557	0	1,817	1,286
3065	M	528	528	528	0	690	242
3067	M	287	287	287	0	376	84
3072	M	576	576	576	0	710	384
3074	I	1,050	1,397	1,050	0	1,921	162
3075	I	185	410	185	0	1,101	185
* 3076	I	1,575	1,575	1,575	0	2,963	1,522
3077	I	2,756	3,714	3,656	0	4,100	2,756
3078	M	12	12	12	0	66	12
3079	I	685	968	685	0	1,503	262
3080	M	264	264	264	0	1,162	264
3081	I	179	513	402	0	606	153
3097	M	480	480	480	0	610	480
3100	M	1,478	1,478	1,478	0	1,685	943
3101	M	3,012	3,012	3,012	0	3,478	1,857
4001	I	1,085	1,321	1,085	0	1,473	379
* 4002	M	3,080	3,080	3,080	0	3,511	2,731
4003	I	2,714	3,468	3,097	0	3,848	1,749
4004	M	1,368	1,368	1,368	0	1,626	1,368
4006	M	684	684	684	0	897	684
4007	M	1,726	1,726	1,726	0	2,193	1,726
4008	M	1,787	1,787	1,787	0	2,158	1,412
4009	M	852	852	852	0	1,037	677
4010	M	1,048	1,048	1,048	0	1,361	505
4011	M	1,482	1,482	1,482	0	1,818	756
4012	M	865	865	865	0	1,046	780
4013	M	1,867	1,867	1,867	0	2,504	954
4015	M	1,263	1,263	1,263	0	1,510	860

Appendix B-5 (continued)

ESTIMATED LONG-TERM STOCKING RATES

Allotment	Allotment Category	PA AUMs	DPA AUMs	IPA AUMs	ELG AUMs	MAX AUMs	DLG AUMs
4016	M	2,064	2,064	2,064	0	3,122	1,606
4017	M	1,268	1,268	1,268	0	1,470	1,259
* 4018	M	.585	585	585	0	1,057	585
4019	I	2 497	2,844	2,617	0	3,873	2,497
* 4020	M	1 842	1,842	1,842	0	2,692	1,842
4021	I	1,714	2,048	1,736	0	2,288	947
4022	I	150	477	412	0	498	113
4023	I	285	368	368	0	790	285
4025	I	2,505	3,259	2,523	0	3,894	1,222
4026	M	4,722	4,722	4,722	0	5,621	3,958
4026	M	383	383	383	0	540	383
* 4028	I	1,458	1,743	1,553	0	1,947	1,040
* 4029	M	2,154	2,154	2,154	0	2,485	1,689
4030	I	1,789	2,012	1,869	0	2,262	1,005
* 4031	M	2,171	2,171	2,171	0	2,618	1,302
* 4032	I	960	1,160	972	0	1,294	325
4033	M	1,167	1,167	1,167	0	1,478	780
4037	M	4,259	4,259	4,259	0	5,438	2,941
4038	I	1,236	1,514	1,236	0	1,704	473
4039	I	912	963	912	0	1,091	592
4040	I	121	1,455	1,121	0	1,874	603
* 4041	M	2,153	2,153	2,153	0	2,951	1,826
4042	M	843	843	843	0	1,051	843
4043	M	639	639	639	0	1,039	639
* 4044	M	1 198	1,198	1,198	0	1,611	863
4045	M	555	555	555	0	666	459
* 4046	I	1,672	2,261	1,988	0	2,603	1,559
4048	M	108	108	108	0	150	47
4049	I	2,223	4,218	4,074	0	4,529	1,978
4050	I	644	719	668	0	1,227	644
4051	I	895	1,990	1,751	0	2,115	414
4053	M	975	975	975	0	1,217	975
4054	M	103	103	103	0	117	83

Appendix B-5 (continued)

ESTIMATED LONG-TERM STOCKING RATES

Allotment	Allotment Category	PA AUMs	DPA AUMs	IPA AUMs	ELG AUMs	MAX AUMs	DLG AUMs
4055	M	105	105	105	0	377	105
4056	I	360	515	360	0	867	280
4057	M	479	479	479	0	625	156
4060	M	3,736	3,736	3,736	0	4,519	3,512
4061	M	4,006	4,006	4,006	0	4,834	3,176
4062	M	967	967	967	0	1,114	949
4064	M	450	450	450	0	696	282
4065	M	1,014	1,014	1,014	0	1,941	1,014
* 4066	M	4,517	4,517	4,517	0	5,590	3,169
* 4066	M	4,860	4,860	4,860	0	6,521	4,860
4067	I	1,643	1,894	1,643	0	2,124	434
4068	M	1,508	1,508	1,508	0	1,939	613
4069	M	432	432	432	0	576	311
4073	I	1,510	1,739	1,510	0	1,950	843
4075	M	336	336	336	0	455	173
4076	I	280	351	280	0	410	102
4079	I	1,351	1,652	1,387	0	1,841	616
4080	M	441	441	441	0	667	221
4082	M	675	675	675	0	943	298
4084	M	879	879	879	0	1,021	835
4085	M	710	710	710	0	809	606
0000	M	6,000	6,000	6,000	0	7,257	4,958
1001 a/	C	30	30	30	0	30	30
1002	C	3	3	3	0	3	3
1003	C	120	120	120	0	120	120
1004	C	23	23	23	0	23	23
1005	C	165	165	165	0	165	165
1006	C	60	60	60	0	60	60
1007	C	60	60	60	0	60	60
1008	C	515	515	515	0	515	515
2001	C	8	8	8	0	8	8
2002	C	17	17	17	0	17	17
2003	C	75	75	75	0	75	75

Appendix B-5 (continued)

ESTIMATED LONG-TERM STOCKING RATES

Allotment	Allotment Category	PA AUMs	DPA AUMs	IPA AUMs	ELG AUMs	MAX AUMs	DLG AUMs
2004	C	12	12	12	0	12	12
2005	C	8	8	8	0	8	8
2006	C	38	38	38	0	38	38
2007	C	34	34	34	0	34	34
2008	C	160	160	160	0	160	160
2009	C	285	285	285	0	285	285
2010	C	23	23	23	0	23	23
2011	C	20	20	20	0	20	20
2012	C	68	68	68	0	68	68
2013	C	68	68	68	0	68	68
2014	C	4	4	4	0	4	4
2015	C	30	30	30	0	30	30
2016	C	32	32	32	0	32	32
2017	C	80	80	80	0	80	80
2018	C	60	60	60	0	60	60
2019	C	12	12	12	0	12	12
2020	C	100	100	100	0	100	100
2021	C	52	52	52	0	52	52
2022	C	8	8	8	0	8	8
2023	C	13	13	13	0	13	13
2024	C	2	2	2	0	2	2
2025	C	65	65	65	0	65	65
2026	C	6	6	6	0	6	6
2027	C	8	8	8	0	8	8
2028	C	15	15	15	0	15	15
2029	C	6	6	6	0	6	6
2030	C	20	20	20	0	20	20
2031	C	240	240	240	0	240	240
2032	C	120	120	120	0	120	120
2033	C	360	360	360	0	360	360
2035	C	320	320	320	0	320	320
2036	C	240	240	240	0	240	240
2037	C	84	84	84	0	84	84

Appendix B-5 (continued)

ESTIMATED LONG-TERM STOCKING RATES

Allotment	Allotment Category	PA AUMs	DPA AUMs	IPA AUMs	ELG AUMs	MAX AUMs	DLG AUMs
2038	C	106	106	106	0	106	106
2039	C	45	45	45	0	45	45
2040	C	54	54	5	0	54	54
2041	C	9	9	9	0	9	9
2042	C	324	324	324	0	324	324
2043	C	25	25	25	0	25	25
2044	C	15	15	15	0	15	15
2045	C	144	144	144	0	144	144
2046	C	324	324	324	0	324	324
2047	C	960	960	960	0	960	960
2048	C	29	29	29	0	29	29
2051	C	720	720	720	0	720	720
2052	C	12	12	12	0	12	12
2053	C	540	540	540	0	540	540
2054	C	804	804	804	0	804	804
2055	C	144	144	144	0	144	144
2056	C	24	24	24	0	24	24
2057	C	30	30	30	0	30	30
2058	C	235	235	235	0	235	235
2059	A	24	24	24	0	24	24
2060	C	420	420	420	0	420	420
2061	C	576	576	576	0	576	576
2062	C	80	80	80	0	80	80
2063	C	30	30	30	0	30	30
2064	C	264	264	264	0	264	264
2065	C	13	13	13	0	13	13
2066	C	60	60	60	0	60	60
2068	C	24	24	24	0	24	24
2069	C	312	312	312	0	312	312
2073	C	65	65	65	0	65	65
2074	C	44	44	44	0	44	44
2075	C	456	456	456	0	456	456
2076	C	59	59	59	0	59	59

Appendix B-5 (continued)

ESTIMATED LONG-TERM STOCKING RATES

Allotment	Allotment Category	PA AUMs	DPA AUMs	IPA AUMs	ELG AUMs	MAX AUMs	DLG AUMs
2077	C	260	260	260	0	260	260
2078	C	36	36	36	0	36	36
2079	C	9	9	9	0	9	9
2080	C	240	240	240	0	240	240
2081	C	26	26	26	0	26	26
2082	C	25	25	25	0	25	25
2083	C	8	8	8	0	8	8
2084	C	51	51	51	0	51	51
2085	C	33	33	33	0	33	33
2086	C	72	72	72	0	72	72
3001	C	45	45	45	0	45	45
3002	C	56	56	56	0	56	56
3003	C	720	720	720	0	720	720
3005	C	540	540	540	0	540	540
3006	C	420	420	420	0	420	420
3007	C	48	48	48	0	48	48
3008	C	348	348	348	0	348	348
3009	C	140	140	140	0	140	140
3010	C	240	240	240	0	240	240
3013	C	140	140	140	0	140	140
3014	C	168	168	168	0	168	168
3022	C	135	135	135	0	135	135
3023	C	52	52	52	0	52	52
3024	C	28	28	28	0	28	28
3025	C	492	492	492	0	492	492
3026	C	24	24	24	0	24	24
3027	C	24	24	24	0	24	24
3028	C	930	930	930	0	930	930
3031	C	36	36	36	0	36	36
3038	C	351	351	351	0	351	351
3040	C	816	816	816	0	816	816
3043	C	408	408	408	0	408	408
3044	C	252	252	252	0	252	252

Appendix B-5 (continued)

ESTIMATED LONG-TERM STOCKING RATES

Allotment	Allotment Category	PA AUMs	DPA AUMs	IPA AUMs	ELG AUMs	MAX AUMs	DLG AUMs
3045	C	216	216	216	0	216	216
3050	C	276	276	276	0	276	276
3051	C	216	216	216	0	216	216
3052	C	108	108	108	0	108	108
3054	C	12	12	12	0	12	12
3055	C	312	312	312	0	312	312
3056	C	108	108	108	0	108	108
3057	C	12	12	12	0	12	12
3060	C	396	396	396	0	396	396
3068	C	156	156	156	0	156	156
3069	C	12	12	12	0	12	12
3070	C	8	8	8	0	8	8
3071	C	15	15	15	0	15	15
3073	C	60	60	60	0	60	60
3082	C	108	108	108	0	108	108
3083	C	12	12	12	0	12	12
3084	C	84	84	84	0	84	84
3085	C	36	36	36	0	36	36
3086	C	12	12	12	0	12	12
3087	C	96	96	96	0	96	96
3088	C	24	24	24	0	24	24
3089	C	12	12	12	0	12	12
3090	C	96	96	96	0	96	96
3091	C	804	804	804	0	804	804
3092	C	120	120	120	0	120	120
3093	C	12	12	12	0	12	12
3094	C	12	12	12	0	12	12
3095	C	36	36	36	0	36	36
3096	C	12	12	12	0	12	12
3098	C	6	6	6	0	6	6
3099	C	1	1	1	0	1	1
4005	C	180	180	180	0	180	180
4014	C	96	96	96	0	96	96

Appendix B-5 (continued)

ESTIMATED LONG-TERM STOCKING RATES

Allotment	Allotment Category	PA AUMs	DPA AUMs	IPA AUMs	ELG AUMs	MAX AUMS	DLG AUMs
4024	C	36	36	36	0	36	36
4027	C	548	548	548	0	548	548
4034	C	36	36	36	0	36	36
4035	C	12	12	12	0	12	12
4036	C	24	24	24	0	24	24
4047	C	36	36	36	0	36	36
4052	C	24	24	24	0	24	24
4058	C	48	48	48	0	48	48
4059	C	108	108	108	0	108	108
4063	C	216	216	216	0	216	216
4070 b/	C						
* 4071	C	24	24	24	0	24	24
4074	C	132	132	132	0	132	132
4077	C	141	141	141	0	141	141
4078	C	72	72	72	0	72	72
4081	C	36	36	36	0	36	36
4083	C	192	192	192	0	192	192
4086	C	132	132	132	0	132	132
4087	C	12	12	12	0	12	12
TOTAL		228,656	246,028	236,937	0	296,061	175,686

Source: RRA EIS Files

a/ "C" category allotments were not adjusted due to the small amount of public land involved.

b/ Allotment 4070 recently created as a division of 4010; AUMs are reflected in 4010.

* AMP allotments

APPENDIX C

RANGELAND IMPROVEMENTS

APPENDIX C-1

RANGE IMPROVEMENTS/VEGETATION TREATMENTS FOR THE IPA AND DPA ALTERNATIVES

Allot. Number	Development or Treatment	Quantity or Unit	Long Term Additional AUMs Available Through Development or Treatment	B/C Ranking a /
2067	Mesquite Control (Mechanical)	300 ac.	60	3.51
2070	Mesquite Control (Chemical)	5640 ac	1128	8.32
2071	Waters	4		
	Pipeline	4 mi.		
	Fence	2 mi.		
	Subtotal		84	2.20
3019	Cholla Control (Mechanical)	1600 ac.	181	2.14
3021	Cholla Control (Mechanical)	1920 ac.	218	2.27
	Waters	3		
	Pipeline	3 mi.		
	Subtotal		48	
3034	Snakeweed Control (Chemical)	7102 ac.	946	5.63
3039	Snakeweed Control (Chemical)	1040 ac.	139	2.50
	Fence	7 mi.	42	
3049	Prescribed Burn	400 ac.	88	0.96
	Fence	5.5 mi.	33	2.01
3053	Waters	2		
	Pipeline	1.5 mi.		
	Subtotal		33	
3077	Cholla Control (Mechanical)	7920 ac.	900	2.39
3081	Creosote Control (Chemical)	1970 ac.	223	3.08
4003	Cholla Control (Mechanical)	2240 ac.	255	3.00
	Mesquite Control (Mechanical)	640 ac.	128	
4019	Waters	2		
	Pipeline	2 mi.		
	Fence	14 mi.		
	Subtotal		120	1.44
4021	Prescribed Burn	100 ac.	22	2.00
4022	Mesquite Control (Chemical)	1220 ac.	244	6.03
	Waters	1		
	Pipeline	1 mi.		
	Subtotal		18	
4023	Cholla Control (Mechanical)	730 ac.	83	1.87
4025	Waters	1		
	Fence	5 mi.		
	Subtotal		18	1.47
4028	Waters	5		
	Pipeline	8.75 mi.		
	Fence	1 mi.		
	Subtotal		95	1.79
4030	Waters	5		
	Pipeline	3.25 mi.		
	Subtotal		80	2.97
4032	Fence	2 mi.	12	0.66

Appendix C-1 (continued)

RANGE IMPROVEMENTS/VEGETATION TREATMENTS FOR THE IPA AND DPA ALTERNATIVES

Allot. Number	Development or Treatment	Quantity or Unit	Long Term Additional AUMs Available Through Development or Treatment	B/C Ranking a /
4046	Mesquite Control (Mechanical)	845 ac.	169	4.61
	Waters	7		
	Pipeline	5 mi.		
	Subtotal		114	
	Prescribed Burn	150 ac.	33	
4049	Mesquite Control (Chemical)	8925 ac.	1785	8.14
	Waters	4		
	Pipeline	3 mi.		
	Subtotal		66	
4050	Waters	2	24	2.18
4051	Mesquite Control (Chemical)	4280 ac.	856	8.12
4079	Waters	2		
	Pipeline	1 mi.		
	Fence	1 mi.		
	Subtotal		36	1.84
	Total AUMs		8281	

Source: BLM RRA Files

a / Preliminary Benefit/Cost rankings of projects from 1 to 10; rankings are a result of preliminary input into the SageRam program: additional input is required prior to making a final rankings, including recommendations from the Grazing Advisory Board and Management.

APPENDIX C-2

RANGE IMPROVEMENTS/VEGETATION TREATMENTS FOR THE MAX ALTERNATIVE

Allot. Number	Development or Treatment	Quantity or Unit	Long Term Additional AUMs Available Through Development or Treatment	B/C Ranking a/
2034	Waters	1	12	1.21
2067	Mesquite Control (Mechanical)	300 ac.	60	3.51
2070	Mesquite Control (Chemical)	5640 ac.	1128	8.32
2071	Waters	4		
	Pipeline	4 mi.		
	Fence	2 mi.		
	Subtotal		84	2.20
2072	Waters	2		
	Pipeline	1.2 mi.		
	Fence	2 mi.		
	Subtotal		42	1.75
3011	Waters	3		
	Pipeline	5 mi.		
	Subtotal		66	2.09
3011	Water	1		
	Pipeline	1 mi.		
	Subtotal		18	1.30
3016	Waters	1		
	Pipeline	3.5 mi.		
	Subtotal		33	1.40
3019	Cholla Control (Mechanical)	1600 ac.	181	2.14
3020	Prescribed Burn	400 ac.	88	9.00
3021	Cholla Control	1920 ac.	218	2.27
	Waters	3		
	Pipeline	3 mi.		
	Subtotal		48	
3029	Waters	1		
	Pipeline	1 mi.		
	Subtotal		24	1.74
3032	Waters	1		
	Pipeline	1 mi.		
	Subtotal		18	1.30
3034	Snakeweed Control (Chemical)	7102 ac.	946	5.63
3035	Prescribed Burn	200 ac.	44	5.00
3036	Fence	2.5 mi.	15	.73
3037	Waters	1		
	Pipeline	.6 mi.		
	Subtotal		18	1.47
3039	Snakeweed Control (Chemical)	1040 ac.	139	2.50
	Fence	7 mi.	42	
3041	Waters	1		
	Pipeline	1.3 mi.		
	Subtotal		18	1.20
3046	Water tubs	1		
	Pipeline	1 mi.		
	Subtotal		18	1.30

Appendix C-2 (continued)

RANGE IMPROVEMENTS/VEGETATION TREATMENTS FOR THE MAX ALTERNATIVE

Allot. Number	Development or Treatment	Quantity or Unit	Long Term Additional AUMs Available Through Development or Treatment	B/C Ranking a /
3047	Waters	1	12	1.21
3049	Prescribed Burn	400 ac.	88	0.96
	Fence	5.5 mi.	33	
3053	Waters	2		
	Pipeline	1.5 mi.		
	Subtotal		33	2.01
3059	Waters	1		
	Pipeline	1 mi.		
	Subtotal		18	1.30
3061	Waters	2	24	2.18
3062	Fence	2.75 mi.	17	0.87
3063	Waters	1		
	Pipeline	1 mi.		
	Subtotal		18	1.23
3064	Waters	2		
	Pipeline	3 mi.		
	Subtotal		42	1.85
3065	Fence	2 mi.	12	0.66
3072	Waters	1	12	1.21
3077	Cholla Control (Mechanical)	7920 ac.	900	2.39
3081	Creosote Control (Chemical)	1970 ac.	223	3.08
4003	Cholla Control (Mechanical)	2240 ac.	255	3.00
	Mesquite Control (Mechanical)	640 ac.	128	
4004	Waters	1	12	1.21
4009	Prescribed Burn	150 ac.	33	3.00
4010	Waters	1	12	1.21
4012	Waters	3		
	Pipeline	4 mi.		
	Subtotal		60	2.17
4013	Prescribed Burn	480 ac.	106	10.00
4017	Waters	1		
	Pipeline	2 mi.		
	Subtotal		24	1.36
4019	Waters	2		
	Pipeline	2 mi.		
	Fence	14 mi.		
	Subtotal		120	1.44
4021	Prescribed Burn	100 ac.	22	2.00
4022	Mesquite Control (Chemical)	1220 ac.	244	6.03
	Waters	1		
	Pipeline	1 mi.		
	Subtotal		18	
4023	Cholla Control (Mechanical)	730 ac.	83	1.87
4025	Water Tubs	1		
	Fence	.5 mi.		
	Subtotal		18	1.47

RANGE IMPROVEMENTS/VEGETATION TREATMENTS FOR THE MAX ALTERNATIVE

Allot. Number	Development or Treatment	Quantity Or Unit	Long Term Additional AUMs Available Through Development or Treatment	B/C Ranking a/
4026	Cholla Control (Mechanical)	1460 ac.	166	2.13
	Waters	3		
	Pipeline	4 mi.		
	Fence	2 mi.		
	Subtotal		72	
4028	Waters	5		
	Pipeline	8.75 mi.		
	Fence	1 mi.		
	Subtotal		95	1.79
4030	Waters	5		
	Pipeline	3.25 mi.		
	Subtotal		80	2.97
4031	Waters	4		
	Pipeline	.5 mi.	51	3.38
4032	Fence	2 mi.	12	0.66
4043	Mesquite Control (Chemical)	1480 ac.	296	6.63
	Waters	1		
	Pipeline	.5 mi.		
	Subtotal		15	
4046	Mesquite Control (Mechanical)	845 ac.	169	4.61
	Waters	7		
	Pipeline	5 mi.		
	Subtotal		114	
	Prescribed Burn	150 ac.	33	
4049	Mesquite Control (Chemical)	8925 ac.	1785	8.14
	Waters	4		
	Pipeline	3 mi.		
	Subtotal		66	
4050	Waters	2	24	2.18
4051	Mesquite Control (Chemical)	4280 ac.	856	8.12
4060	Waters	1	12	1.24
4061	Waters	1		
	Pipeline	1 mi.		
	Subtotal		18	1.30
4062	Waters	1	12	1.21
4068	Creosote Control	80 ac.	9	0.69
4069	Waters	2		
	Pipeline	2 mi.		
	Subtotal		36	1.92
4079	Waters	2		
	Pipeline	1 mi.		
	Fence	1 mi.		
	Subtotal		36	1.84

RANGE IMPROVEMENTS/VEGETATION TREATMENTS FOR THE MAX ALTERNATIVE

Allot. Number	Development or Treatment	Quantity or Unit	Long Term Additional AUMs Available Through Development or Treatment	B/C Ranking a /
4080	Waters	2		
	Pipeline	2 mi.		
	Subtotal		36	1.92
4084	Fence	2.75 mi.	19	0.87
	Total AUMS		9839	

Source: BLM RRA files

a / Preliminary Benefit/Cost rankings of projects from 1 to 10; rankings are a result of preliminary input into the SageRam program; additional input is required prior to making final rankings, including recommendations from the Grazing Advisory Board and Management.

APPENDIX C-3
SHINNERY OAK CONTROL FOR EAST CHAVES COUNTY (DPA) a/

Allot. No.	Operator	Quantity (ac)	AUMs Gain
5051	Marley	19,175	2,931
5049	Clemmons & Erdman	3.000	389
5043	Sand Ranch	7,065	830
5032	Davis	7,680	989
5053	Pearce	3,300	468
5075	Bogle	107,520	10,418
5038	Graham	1,600	175
5085	Taylor & Medlin	3,200	351
5074	Barbe	1,280	184
	TOTAL	153,820	16,735

Source: BLM RRA Files
a/ By order of B/C ranking

APPENDIX C-4

RANGE IMPROVEMENTS - BENEFIT/COST DETERMINATIONS

Several assumptions were made so that a benefit/cost ratio could be developed and AUM gains determined for each range improvement. A cost for each improvement was determined by taking an average cost of similar projects recently completed in the district. Average costs were:

1 Mile Fence with labor	$3,000.00
Water Location (tub)	700.00
Water Storage	9,000.00
1 Mile Pipeline with Labor	2,500.00
Brush Control:	
Mesquite (Chemical)	12.00 per acre
Mesquite (Mechanical)	25.00 per acre
Snakeweed (Chemical)	12.00 per acre
Cholla (Mechanical)	25.00 per acre
Creosote (Chemical)	17.00 per acre

Other assumptions that were made included the benefits from the range improvement projects. These assumptions are:

1. Mesquite control would improve the livestock carrying capacity to 5 acres/AUM.
2. Snakeweed control would improve carrying capacity to 7.5 acres/AUM.
3. Creosote control would improve carrying capacity to 8.8 acres/AUM.
4. Cholla control would improve carrying capacity to 8.8 acres/AUM.
5. Burns would improve carrying capacity from an average of 3.57 acres/AUM to 2 acres/AUM.
6. One watering tub would improve its service area by 12 AUMs.
7. One mile of pipeline would improve its service area by 6 AUMs.
8. One mile of fence would improve an area by 6 AUMs

(Some of these range improvements, by themselves, could not improve range conditions. They are needed, however, so other improvements can operate properly. Accordingly, AUM values were assigned to each part of a project.)

An assumption was made that, through cooperative management, range condition could be improved one condition class. For example, a ranch in fair condition could improve to good condition; a ranch in mid-fair condition could improve to mid-good condition. The assumption was made that ranches in good and excellent condition would stay that way. Cooperative management entails the joint development of grazing systems, CMPs, or other plans designed to improve range condition.

APPENDIX D

SOILS/WATERSHED

Form 7310–12
(May 1973)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

By | Date

Location

Treatment affecting the SSF

DETERMINATION OF EROSION CONDITION CLASS
SOIL SURFACE FACTORS (SSF)

SOIL MOVEMENT*	No visual evidence of movement 0 1 2 3	Some movement of soil particles 4 5	Moderate movement of soil is visible and recent. Slight terracing generally less than 1" in height. 6 7 8	Occurs with each event. Soil and debris deposited against minor obstructions. 9 10 11	Subsoil exposed over much of area, may have embryonic dunes and wind scoured depressions 12 13 14
SURFACE LITTER*	Accumulating in place 0 1 2 3	May show slight movement 4 5 6	Moderate movement is apparent, deposited against obstacles 7 8	Extreme movement apparent, large and numerous deposits against obstacles 9 10 11	Very little remaining *(use care on low productive sites)* 12 13 14
SURFACE ROCK*	If present, the distribution of fragments show no movement caused by wind or water 0 1 2	If present, coarse fragments have a truncated appearance or spotty distribution caused by wind or water 3 4 5	If present, fragments have a poorly developed distribution pattern caused by wind or water 6 7 8	If present, surface rock or fragments exhibit same movement and accumulation of smaller fragments behind obstacles 9 10 11	If present, surface rock or fragments are dissected by rills and gullies or are already washed away 12 13 14
PEDESTALLING*	No visual evidence of pedestalling 0 1 2 3	Slight pedestalling, in flow patterns 4 5 6	Small rock and plant pedestals occurring in flow patterns 7 8 9	Rocks and plants on pedestals generally evident, plant roots exposed 10 11	Most rocks and plants pedestalled and roots exposed 12 13 14
FLOW PATTERNS*	No visual evidence of flow patterns 0 1 2 3	Deposition of particles may be in evidence 4 5 6	Well defined, small, and few with intermittent deposits 7 8 9	Flow patterns contain silt and sand deposits and alluvial fans 10 11 12	Flow patterns are numerous and readily noticeable. May have large barren fan deposits. 13 14 15
RILLS	No visual evidence of rills 0 1 2 3	Some rills in evidence at infrequent intervals over 10' 4 5 6	Rills ½" to 6" deep occur in exposed places at approximately 10' intervals 7 8 9	Rills ½" to 6" deep occur in exposed area at intervals of 5 to 10' 10 11 12	May be present at 3" to 6" deep at intervals less than 5' 13 14
GULLIES	May be present in stable condition. Vegetation on channel bed and side slopes 0 1 2 3	A few gullies in evidence which show little bed or slope erosion. Some vegetation is present on slopes. 4 5 6	Gullies are well developed with active erosion along less than 10% of their length. Some vegetation may be present. 7 8 9	Gullies are numerous and well developed with active erosion along 10 to 50% of their lengths or a few well developed gullies with active erosion along more than 50% of their length 10 11 12	Sharply incised gullies cover most of the area and over 50% are actively eroding 13 14 15

SITUATION	TOTAL				

Erosion Condition Classes: Stable 0–20; Slight 21–40; Moderate 41–60; Critical 61–80; Severe 81–100

(Instructions on reverse)

EXAMPLES

ITEM	EXAMPLE ONE			EXAMPLE TWO**			EXAMPLE THREE***		
	POTENTIALLY PRESENT	IDENTIFIED FACTORS	POSSIBLE FACTOR	POTENTIALLY PRESENT	IDENTIFIED FACTORS	POSSIBLE FACTOR	POTENTIALLY PRESENT	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Yes	8	14	Yes	8	14	Yes	8	14
Surface Litter	Yes	9	14	Yes	9	14	Yes	9	14
Surface Rock	Yes	7	14	No	–	– –	No	–	– –
Pedestalling	Yes	10	14	Yes	10	14	Yes	10	14
Rills	Yes	8	14	Yes	8	14	No	–	– –
Flow Patterns	Yes	10	15	Yes	10	15	Yes	10	15
Gullies	Yes	6	15	No	–	– –	No	–	– –
TOTAL		58	100		45	71		37	57
Total SSF	$\frac{58}{100} \times 100 = 58$			$\frac{45}{71} \times 100 = 63$			$\frac{37}{57} \times 100 = 65$		

GENERAL INSTRUCTIONS

District prepares one (1) copy and files in district with particular study under consideration.

Do *not* include items in computations which are not potentially present.

Identify numerical factor that most nearly describes the conditions observed by circling the factor given for each logical item.

Wind and water are considered eroding agents when evaluating item
**A soil with no rocks in its profile and no probability of gullying*
***A pumice soil area where no water erosion occurs*

SPECIFIC INSTRUCTIONS

Total all factors at bottom of page. Divide total identified factors by total possible factors for items considered and multiply by 100 in order to compute the SSF.

Situation – Describe situations being evaluated such as present, geologic, with mechanical treatment in effect for 10 years, under a 5 pasture livestock management system for last 8 years, etc.

Total – Total computed SSF.

☆ GPO 1976-678-777-678/8

APPENDIX D-2
PSIAC METHODOLOGY

The Pacific Southwest Inter-Agency Committee's (PSIAC) (1968) method for determining relative soil loss was used to compute the water erosion portion of the soils section.

The Sediment Yield Classification is:

Classification	Rating	Sediment Yield ac.ft./sq. mi./yr.
1 Severe	More than 100	More than 3.0
2 Critical	75-100	1.0-3.0
3 Moderate	50- 75	0.5-1.0
4 Slight	25- 50	0.2-0.5
5 Stable	0- 25	Less than 0.2

Nine factors were evaluated for present and future soil loss and points were assigned to each factor by using the PSIAC nomographs. The points were totaled for each soil and they were then placed in erosion classes. The following are the assumptions which were made to determine these ratings.

Note: ac.ft./sq.mi./yr. = acre feet per square mile per year.

Factors	Rating
A. - Surface Geology -	0 - 10

Soil texture from a depth of 0-4 inches was used to determine this rating. Sandy soils received the lowest rating and soils with a high clay content received a high rating.

B. - Soils - 0 - 10

This factor was rated the same as surface geology except the depth is from 4 inches to the effective rooting depth.

C. - Climate - 0 - 10

Climate was rated according to the value on the nomograph for a 2-year isopluvial storm in the NOAA Atlas 2.

D. - Run-off - 0 - 10

Run-off was rated the same as climate for the existing environment.

E. - Topography - 0 -20

This factor was rated according to the percentage of slope. A soil with a 30 percent slope was given the maximum number of points.

Appendix D-2 (continued)

F. - Cover - -10 - +10

The amount of cover includes the percentage of cover from vegetation and coarse fragments on the soil surface. A soil which has 100 percent cover would receive a rating of -10.

G. - Land Use - -10 - +10

Land use was determined by the percentage of utilization from the Vegetation section. A soil with 70 percent utilization would receive a rating of 1.

H. - Upland Erosion - 0 - 25

Soil Surface Factors (SSFs) were used for rating the amount of upland erosion. The SSF for the modal soil was used.

I. - Channel Erosion and Sediment Transport - 0 - 25

The rating for this factor was determined by field observation for the amount of gullying.

All the PSIAC factor points were totaled and were assigned a sediment relative-yield value.

Appendix D-2 (continued)

PSIAC CONVERSION FACTORS

PSIAC Factor	Sediment Yield (ac.ft./sq. mi./yr.)	PSIAC Factor	Sediment Yield (ac.ft./sq. mi./yr.)	PSIAC Factor	Sediment Yield (ac.ft./sq. mi./yr.)	PSIAC Factor	Sediment Yield (ac.ft./sq. mi./yr.)
1	.0	26	.190	51	.52	76	1.25
2	.0	27	.20	52	.53	77	1.30
3	.0	28	.20	53	.55	78	1.35
4	.0	29	.21	54	.56	79	1.40
5	.0	30	.22	55	.58	80	1.45
6	.1	31	.24	56	.60	81	1.50
7	.1	32	.25	57	.63	82	1.55
8	.11	33	.26	58	.65	83	1.60
9	.11	34	.27	59	.68	84	1.65
10	.12	35	.28	60	.70	85	1.78
11	.12	36	.29	61	.73	86	1.80
12	.13	37	.30	62	.75	87	1.90
13	.130	38	.31	63	.79	88	2.00
14	.14	39	.33	64	.82	89	2.05
15	.138	40	.34	65	.85	90	2.10
15	.140	41	.35	66	.87	91	2.15
17	.143	42	.36	67	.91	92	2.20
18	.145	43	.37	68	.95	93	2.30
19	.148	44	.38	69	.98	94	2.40
20	.150	45	.40	70	1.00	95	2.50
21	.160	46	.42	71	1.08	96	2.00
22	.170	47	.44	72	1.15	97	2.70
23	.18	48	.45	73	1.18	98	2.80
24	.19	49	.48	74	1.20	99	2.90
25	.19	50	.50	75	1.23	100	3.00

All These sediment yields were estimated using the PSIAC method for analysis purposes only and were not developed as a result of actual measurements of sediment yield. They indicate relative ranges of values and are considered valid in identifying trends, etc.

APPENDIX D-3

METHODOLOGY FOR DETERMINING WIND ERODIBILITY GROUPS (WEG)

Soils were placed in wind erodibility groups according to the texture of the surface inch of soil, unless very wet or stony, according to the following Soil Conservation Service (SCS) technical guide (1976).

Guide for estimating the Wind Erodibility Group from Soil Textures

Texture of surface inch	WEG
Very fine sand, fine sand, and medium sand	1
Loamy sand, loamy fine sand	2
Very fine sandy loam, fine sandy loam, sandy loam	3
Clay, silty clay, noncalcareous clay loam, and silty clay loam with more than 35 percent clay content	4
Calcareous loam and silt loam, calcareous clay loam and silty clay loam with less than 35 percent clay content	4L
Noncalcareous loam and silt loam with less than 20 percent clay content, sandy clay loam, sandy clay	5
Noncalcareous loam and silt loam with more than 20 percent clay content, noncalcareous clay loam with less than 35 percent clay content	6
Silt: noncalcareous silty clay loam with less than 35 percent clay content	7
Very wet or stony, not subject to wind erosion	8

Adjectives to be used in describing the soil blowing hazard based on wind erodibility group are:

WEG-1	Very High Soil Blowing Hazard
WEG-2	Very High Soil Blowing Hazard
WEG-3	High Soil Blowing Hazard
WEG-4	High Soil Blowing Hazard
WEG-4L	High Soil Blowing Hazard
WEG-5	Moderate Soil Blowing Hazard
WEG-6	Moderate Soil Blowing Hazard
WEG-7	Moderate Soil Blowing Hazard
WEG-8	Slight Soil Blowing Hazard

APPENDIX D-4

METHODOLOGY - SURFACE RUNOFF

The method used to estimate surface runoff is a storm runoff model based on SCS curve number methods. The initial version of this program was developed by R.H. Hawkins, Utah State University. The program is located in the Roswell District Office files.

Determining volume or peak rate of surface runoff from regional areas is difficult to assess because of the many variables involved, such as the differences in topography, climate, soils, vegetative types, ground cover and stocking rates. When assessing the impacts of the Proposed Action and alternatives on surface runoff, several assumptions were made:

1. one square mile watersheds, dominated by one range site;
2. 10-year, 6 hour storm event;
3. average 10 percent slope on hilly sites;
4. average 5 percent slope on gravelly and gravelly loam sites;
5. average 2.5 percent slopes on sandy and shallow sandy areas;
6. one dominant vegetation type for each range site;
7. existing and predicted ground cover taken from phase 1 Watershed Inventory and existing Range studies.

APPENDIX D-5

STATE WATER QUALITY STANDARDS
PECOS RIVER BASIN

1. Includes the main stem of the Pecos River from the headwaters of Lake McMillan upstream to Acme, including flow from below the perrenial reaches of the Rio Penasco, the Rio Hondo, and the Rio Felix which enters the main stem of the Pecos River. Designated uses include irrigation, livestock and wildlife watering, secondary contact recreation, and warm water fishery.

Parameter	Standard
Dissolved Oxygen	5.0 mg/l
pH	6.6 to 8.8
Temperature	32.2° C
Fecal Coliform	1000/100 ml and no more than 10% of samples exceeding 2000/100 ml
TDS	14,000 mg/l at all flows above 50 CFS
Sulfate	3,000 mg/l at all flows above 50 CFS
Chloride	6,000 mg/l at all flows above 50 CFS

2. Includes the main stem of the Pecos River from Acme upstream to Sumner Dam. Designated uses include fish culture, irrigation, limited warm water fishery, livestock and wildlife watering, and secondary contact recreation.

Parameter	Standard
Dissolved Oxygen	5.0 mg/l
pH	6.6 to 8.8
Temperature	32.2° C
Fecal Coliform	1000/100 ml and no more than 10% of samples exceeding 2000/100 ml
TDS	8,000 mg/l at all flows above 50 CFS
Sulfate	2,500 mg/l at all flows above 50 CFS
Chloride	4,000 mg/l at all flows above 50 CFS

3. Includes the perrenial reaches of the Rio Penasco and its tributaries above Dunken, and perrenial reaches of Bonito Creek below Angus, the Rio Ruidoso below Seeping Springs Lakes and Agua Chiquita. Designated uses include fish culture, irrigation, livestock and wildlife watering, marginal coldwater fishery, and secondary contact recreation.

Parameter	Standard
Dissolved Oxygen	greater than 5.0 mg/l
pH	6.6 to 8.8
Temperature	less than 30.0°C
Fecal Coliform	1000/100 ml with no more than 10% of the samples exceeding 2000/100 ml

4. Includes Eagle Creek above Alto Reservoir, Bonito Creek upstream of Angus and the Rio Ruidoso and its tributaries above Seeping Springs Lakes. Designated uses include domestic water supply, fish culture, high quality coldwater fishery, supply, and secondary contact recreation.

Parameter	Standard
Unionized Ammonia (as N)	.02 mg/l
Conductivity	less than 600 micromhos in Eagle Creek less than 1100 micromhos in Bonito Creek less than 1500 micromhos in Rio Ruidoso
Dissolved Oxygen	greater than 6.0 mg/l or 85% of saturation whichever is greater
Total Inorganic Nitrogen (as N)	less than 1.0 mg/l
pH	6.6 to 8.8
Temperature	less than 20.0°C
Total Chlorine Residual	less than .002 mg/l
Total Organic Carbon	less than 7 mg/l
Total Phosphorus	less than 0.1 mg/l
Turbidity	less than 10 FTU
Fecal Coliform Bacteria	less than 100/100 ml and no more than 10% of the samples exceeding 200/100ml

Source: Water Quality Control Commission Standards for Interstate and Intrastate Streams in New Mexico, July 2, 1981.

APPENDIX D-6

WATER QUALITY STANDARDS FOR GROUNDWATER OF 10,000 mg/l TDS CONCENTRATION OR LESS

A. Human Health Standards - Groundwater shall meet the standards of Section A and B unless otherwise provided.

Arsenic (As)	0.1 mg/l
Barium (Ba)	1.0 mg/l
Cadmium (cd)	0.01 mg/l
Chromium (Cr)	0.05 mg/l
Cyanide (CN)	0.2 mg/l
Floride (F)	1.6 mg/l
Lead (Pb)	0.05 mg/l
Total Mercury (Hg)	0.002 mg/l
Nitrate (NO_3 as N)	10.0 mg/l
Selenium (Se)	0.05 mg/l
Silver (Ag)	0.05 mg/l
Uranium (U)	5.0 mg/l
Radioactivity: Combined Radium-226 and Radium-228	30.0 pCi/l
Benzene	0.01 mg/l
Polychlorinated biphenyls (PCBs)	0.001 mg/l
Toluene	15.0 mg/l
Carbon Tetrachloride	0.01 mg/l
1, 2-dichloroethane (EDC)	0.02 mg/l
1, 1-dichloroethylene (1, 1-DCE)	0.005 mg/l
1, 1, 2, 2-tetrachloroethylene (PCE)	0.02 mg/l
1, 1, 2-trichoroethylene (TCE)	0.1 mg/l

B. Other Standards for Domestic Water Supply

Chloride (Cl)	250. mg/l
Copper (Cu)	1.0 mg/l
Iron (Fe)	1.0 mg/l
Manganese (Mn)	0.2 mg/l
Phenols	0.005 mg/l
Sulfate (SO_4)	600 mg/l
Total Dissolved Solids (TDS)	1000. mg/l
Zinc (Zn)	10.0 mg/l
pH	between 6 and 9

C. Standards for Irrigation Use - Groundwater shall meet the standards of subsections A, B, and C unless otherwise provided.

Aluminum (Al)	5.0 mg/l
Boron (B)	0.75 mg/l
Cobalt (Co)	0.05 mg/l
Molybdenum (Mo)	1.0 mg/l
Nickel (Ni)	0.2 mg/l

Source: New Mexico Water Quality Control Commission Regulations as Amended Through January 29, 1982.

APPENDIX D-7

WATER QUALITY CRITERIA FOR LIVESTOCK AND WILDLIFE USE

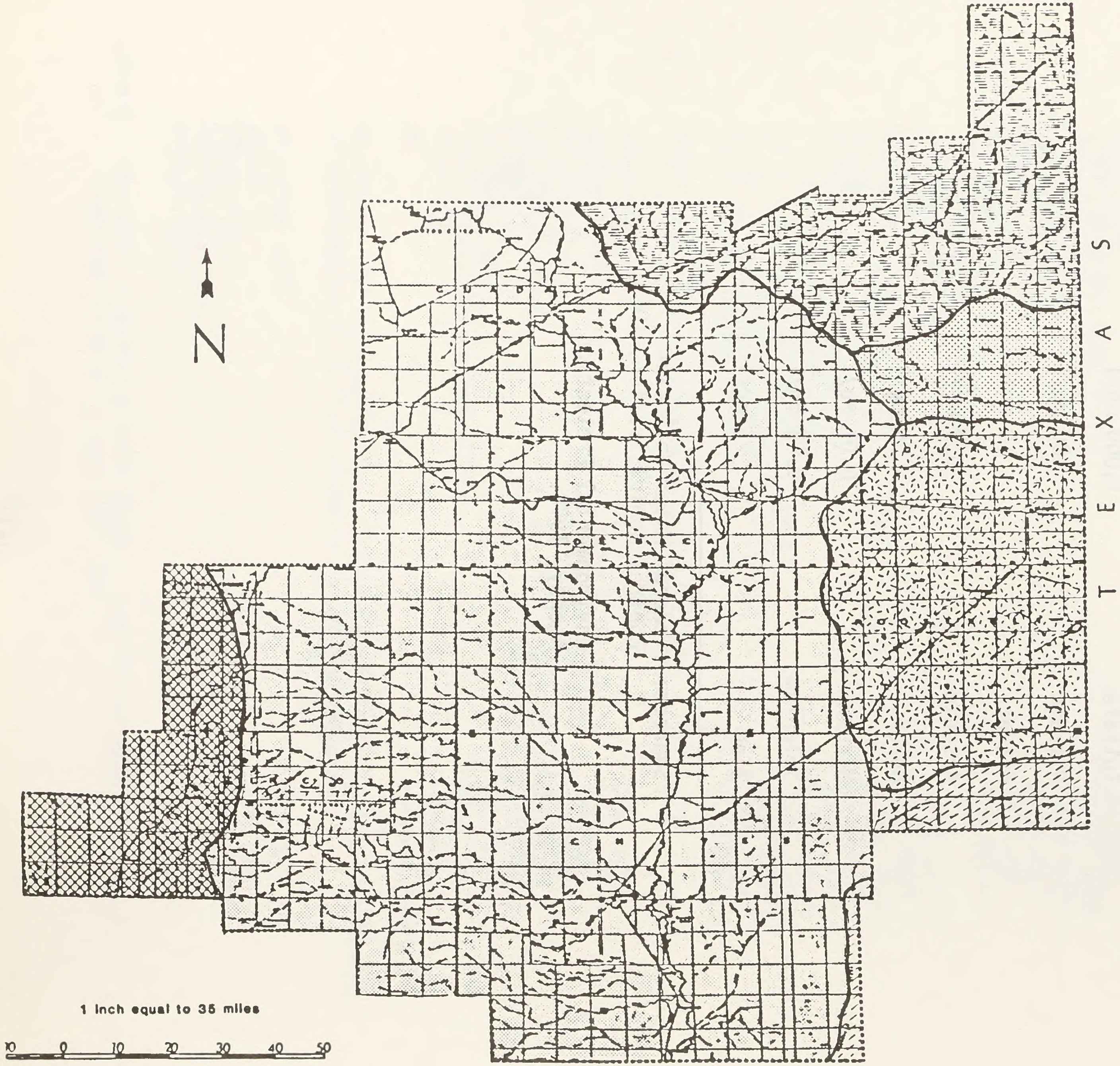
Parameter	Recommended Upper Limit
Salinity	7,000 mg/l
Chloride	1,500 mg/l
Fluoride	2.0 mg/l
Sulfate	1,000 mg/l
Nitrate	100 mg/l
Nitrate	10 mg/l
Arsenic	0.2 mg/l
Boron	5 mg/l
Mercury	0.01 mg/l
Selenium	0.05 mg/l
Zinc	25 mg/l

Sources: Federal Water Pollution Control Administration, 1968.

Environmental Protection Agency, 1972.

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Roswell District Office
Roswell Resource Area
1984
ROSWELL
MANAGEMENT FRAMEWORK PLAN
AMENDMENT
ENVIRONMENTAL IMPACT STATEMENT

Map D-a SURFACE WATER BASINS



SOURCE: NEW MEXICO STATE ENGINEER

ARKANSAS RIVER BASIN
▤ 011 CANADIAN RIVER
SOUTHERN HIGH PLAINS
▒ 021 RED RIVER
▒ 022 BRAZOS RIVER
▨ 023 LEA PLATEAU
PECOS RIVER BASIN
☐ 031 PECOS RIVER
CENTRAL CLOSED BASINS
▦ 043 TULAROSA BASIN

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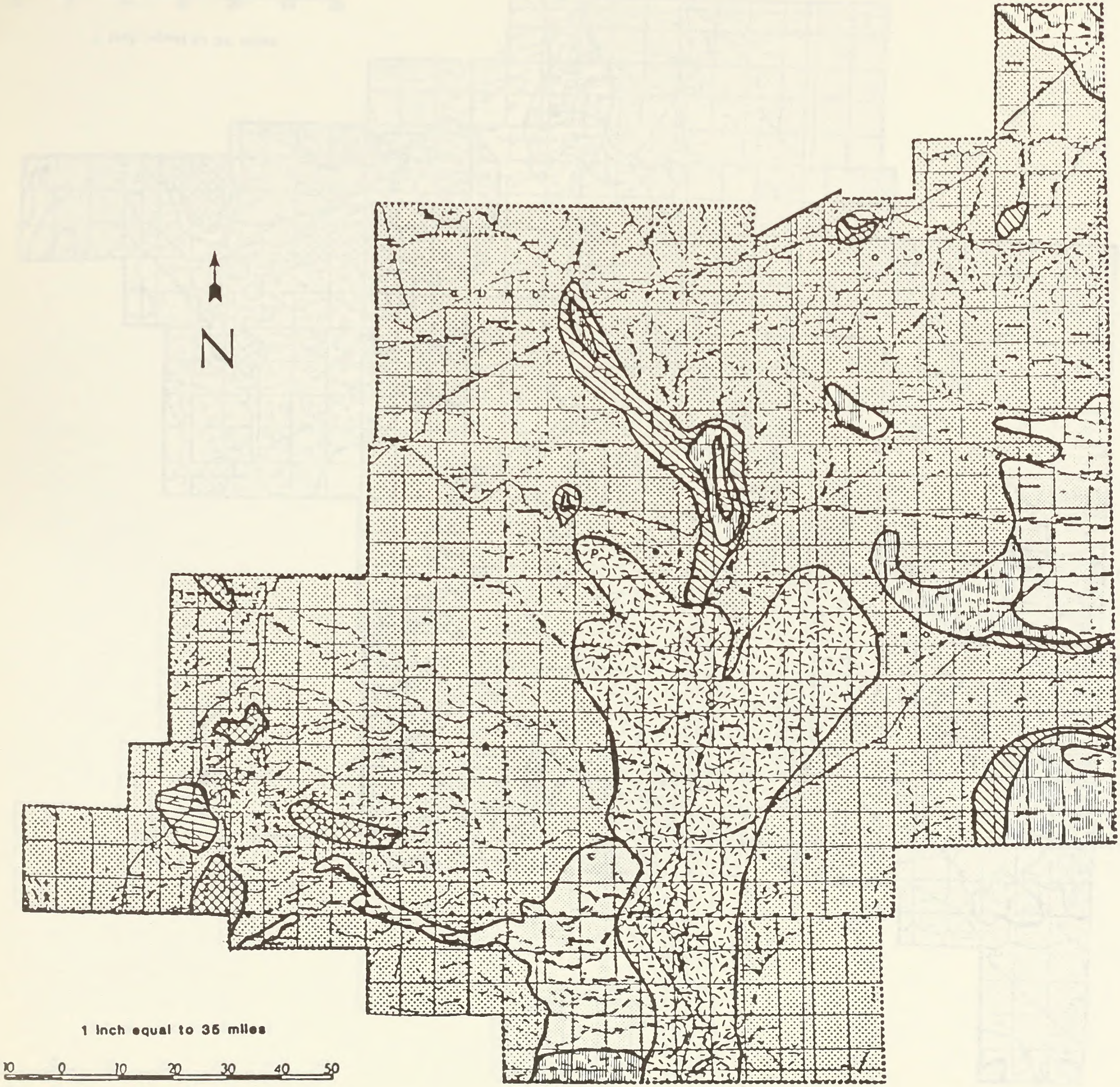
ROSWELL
MANAGEMENT FRAMEWORK PLAN
AMENDMENT
ENVIRONMENTAL IMPACT STATEMENT

Map D-b ESTIMATED POTENTIAL YIELD OF WATER WELLS



QUANTITIES OF WATER WELLS ARE CAPABLE OF YIELDING

- ░ LESS THAN 25 GAL. PER MIN
- ▨ 25-100 GAL. PER MIN.
- ▥ 100-500 GAL. PER MIN.
- ▤ MORE THAN 500 GAL. PER MIN.
- ░ GROUND WATER CONTAINS MORE THAN 3,000 MG. PER LITER DISSOLVED SOLIDS
- ▩ OUTCROPS OF GRANITE, QUARTZITE, RHYOLITE, LARGE MASSES OF INTRUSIVE ROCKS, AND METAMORPHOSED SEDIMENTARY ROCKS

SOURCE: U.S. GEOLOGICAL SURVEY NATIONAL ATLAS

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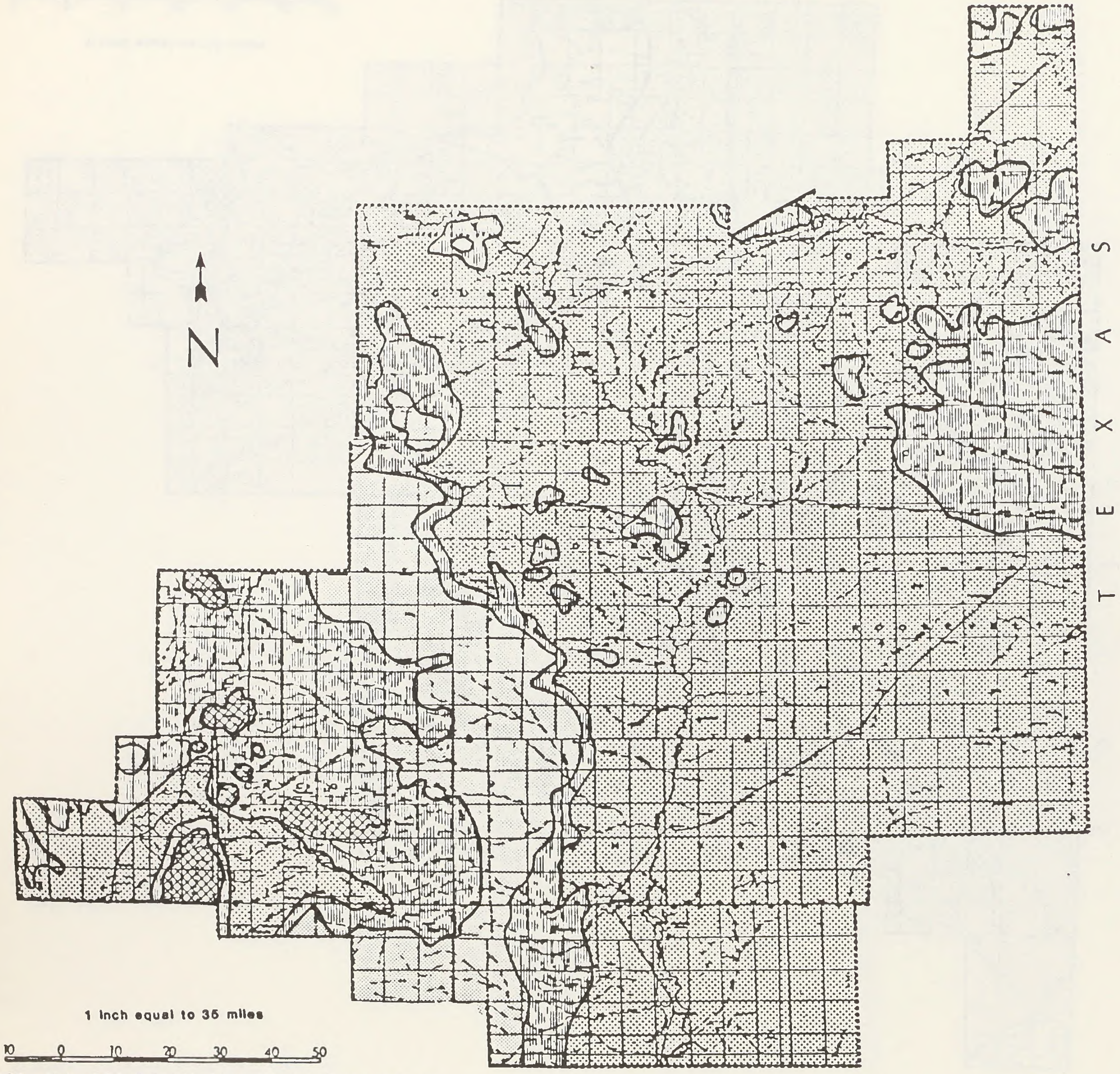


Map D-c GENERAL DEPTH TO GROUND WATER

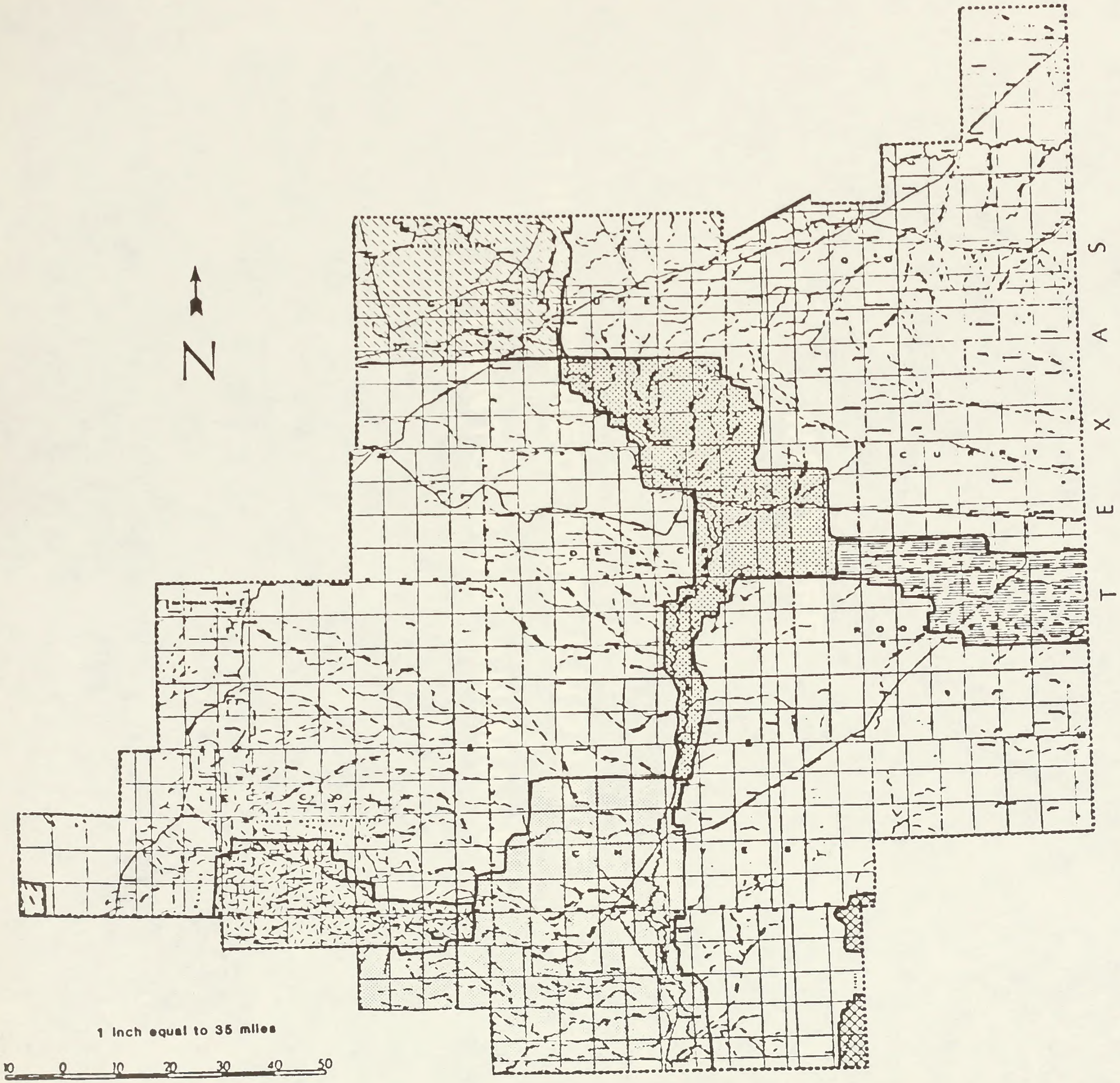
DEPTH TO WATER IN FEET BELOW LAND SURFACE

- ░ LESS THAN 200
- ▥ 200 TO 500
- ▒ MORE THAN 500
- ▩ LESS THAN 100 - AREAS WITH OUTCROPS OF GRANITE, QUARTZITE, RHYOLITE, LARGE MASSES OF INTRUSIVE ROCKS, AND METAMORPHOSED SEDIMENTARY ROCKS

SOURCE: U.S. GEOLOGICAL SURVEY NATIONAL ATLAS

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Roswell District Office
Roswell Resource Area
1984
ROSWELL
MANAGEMENT FRAMEWORK PLAN
AMENDMENT
ENVIRONMENTAL IMPACT STATEMENT

Map D-d DECLARED UNDERGROUND WATER BASINS



░	2 ROSWELL
▩	3 LEA COUNTY
▤	9 PORTALES
▒	10 HONDO
░	20 FORT SUMNER
▨	24 UPPER PECOS

SOURCE: NEW MEXICO STATE ENGINEER

APPENDIX E

WILDLIFE

THREATENED AND ENDANGERED PLANTS AND ANIMALS

APPENDIX E-1
WILDLIFE ANALYSIS METHODOLOGY

Existing Levels

Existing numbers of pronghorn antelope and desert mule deer were obtained from digitized data for 1:250,000 scale maps supplied by New Mexico Department of Game and Fish (Tables E-a and E-b). These data were used to construct Maps 2-2 and 2-3 in Chapter 2. Optimum numbers were provided by the New Mexico Department of Game and Fish.

TABLE E-a
CALCULATED ANTELOPE NUMBERS

Area	Federal Sections	Existing a/ Density/Section	Existing Population	Optimum c/ Density/Section	Optimum Population
C2	36	.08	3	3.0	108
C4	63	.41	26	1.0	63
C5	2	.43	1	0.5	1
ME2	36	.23	8	1.5	54
ME4	2	.76	2	1.0	2
ME6	51	5.88	41	6.0	42
ME7	5	2.78	14	3.0	15
ME9	72	1.02	73	2.0	144
WR2	216	.31	67	1.0	216
Y2	108	.32	35	1.0	108
RS3	216	.05	12	1.0	216
RS4	216	.22	47	0.5	108
RS5	200	.84	168	1.0	200
MI2	180	.58	104	1.2	216
J2	3	.90	3	1.0	3
TOTALS	1362		604 b/		1496

Source: NMDG&F digitized data

a/ New Mexico Department of Game and Fish 1983 Digitized Data (see Map 2-3).

b/ Existing population numbers do not include the 769 antelope within the "Antelope Habitat Study Area".

c/ NMDG&F estimates.

Antelope increases were calculated using an equivalent of 14.5 antelope/AUM. Existing antelope numbers comprised 8 percent of the adjudicated wildlife AUMs, therefore, 8 percent of the AUM increase was given to antelope.

Deer numbers were derived using 9.5 deer/AUM. Existing deer numbers comprised 59 percent of adjudicated wildlife AUMs; therefore, 59 percent of the AUM increase was given to deer.

Appendix E-1 (continued)

TABLE E-b
CALCULATED DESERT MULE DEER NUMBERS

Area	Federal Sections	Existing a/ Density/Section	Existing Population	Optimum c/ Density/Section	Optimum Population
A8	66	.25	17	1.0	66
A9	2	1.00	2	2.0	4
A10	3	3.50	11	4.0	12
A13	382.5	.35	134	0.4	153
A14	43	6.00	258	6.0	258
C2	187	3.00	561	4.0	748
C3 b/	1	2.50	3	4.0	4
R2	234.5	0.08	19	0.1	23
R7	133	1.00	133	1.5	199
R8	436	0.08	35	1.0	436
R9	181	2.00	362	4.0	724
R10	129	3.00	387	4.0	516
R12	332	0.50	166	0.5	166
R13	60	0.50	30	0.5	30
TOTALS	2,190		2,118		3,339

Source: NMDG&F Digitized Data
a/ New Mexico Department of Game & Fish 1983 digitized data maps (see map 2-2)
b/ Excludes Ft. Stanton deer herd
c/ NMDF&G estimates

PA ALTERNATIVE

Short and long term estimates are existing levels.

DPA ALTERNATIVE

The assumption was made that it would take longer than 20 years to reach optimum population levels. The population increase was projected by weighing the habitat availability, proposed projects, and proposed management for their affects on the population. To differentiate between alternatives it was assumed that, together, management and improvements would increase numbers to estimated levels. By themselves, management accounts for 40 percent and range improvements account for 60 percent of the increase between existing and potential levels. Livestock waters are estimated to serve a radius of 1 mile or 3.14 sec. Pipelines and fences were assumed to contribute no effect to antelope or deer (fences would be constructed according to wildlife specifications).

Pronghorn antelope numbers for this alternative were calculated within the parameters of the existing and optimum numbers for each herd unit (NMFG&F). The potential increase was estimated by weighing the habitat availability, proposed projects, and management for their affects on each herd unit.

Deer numbers were calculated in the same manner as antelope. NMDG&F provided optimum numbers for each of the areas in Table E-b. Range improvements accounted for 75 percent of the potential numbers.

Habitat availability was increased by 1.8 percent of the AUMs increased through range improvement. That 1.8 percent increase includes the original wildlife adjudication.

Lesser Prairie Chicken numbers (existing) were taken from the 1983 Lesser Prairie Chicken Lek Census (RRA Files). The Texas Parks and Wildlife Department indicated an estimated density of one bird per 30 acres (approximately 21 chickens per section) on similar Lesser Prairie Chicken habitats in Texas (De Arment, Personal Communication). This figure was used as an optimum number for the Planning Area. Potential numbers were estimated by determining the degree that the habitat would change to resemble the optimum habitat described by Davis et al. (1979).

IPA ALTERNATIVE

Since only range improvements are proposed in this alternative, deer and antelope populations were increased to 60 percent of potential numbers. Total number increased was calculated by multiplying the difference between the appropriate area potential and existing densities by the number of sections affected by a specific proposed treatment described in Appendix C-1 and then by 60 percent (see DPA).

ELG ALTERNATIVE

Antelope numbers were assumed to increase toward optimum levels of 2.5 antelope/sec. on all occupied areas. Occupied antelope habitat is assumed to expand due to movement of antelope onto the unoccupied habitat within the Antelope Study Area.

Deer numbers were assumed to increase optimum levels on all occupied areas.

MAX ALTERNATIVE

Decreases in antelope and deer numbers and available wildlife habitat were calculated using the average interspecific competition for those AUMs given to livestock by increasing vegetation utilization. Competition between deer and antelope, and cattle and sheep was calculated at 33 percent using Kulcynski's similiarily indices and data from Howard et al (1983) and Krausman (1978) cited by Wallmo (1981).

DLG ALTERNATIVE

Habitat availability was increased by adding the total AUMs gained in the alternative to existing wildlife AUMs. Occupied antelope habitat was increased by 300,000 acres due to selection of 196,527 acres of cattle allotments and 103,473 acres of sheep allotments for reintroduction.

APPENDIX E-2
ROSWELL ANTELOPE STUDY

History. In 1940 the New Mexico Department of Game and Fish (NMDF&F) estimated pronghorn (Antilocarpa americana) numbers at 3,000 in an area west of Roswell, New Mexico (Walt Snyder, former Chief of Game Management, NMDG&F). During the 1920's and early 1930's the area west of Roswell, approximately 1.5 million acres, was cross-fenced with net wire (Russell 1964). By 1977 it was estimated that pronghorn numbers had declined to approximately 300 (NMDG&F population estimate). Bear (1969) in Colorado, Hailey et al. (1966) in West Texas, and Russell (1951) in New Mexico have described similar declines in pronghorn populations due to net wire fences.

In 1975 pronghorn fencing directives were issued by the Roswell District and fence modifications were initiated. Livestock ranchers, especially those situated in east central New Mexico, immediately objected to the Federal government's policy of altering fences for pronghorn. In addition, the BLM announced that pronghorn would be reestablished in historic habitat areas west of Roswell in order to comply with Federal regulations which require multiple use management on public lands. In the summer of 1977, a pronghorn "task force" was formed, consisting of 2 area ranchers and 2 representatives each from the BLM, NMDG&F, and the U.S. Fish and Wildlife Service. The "task force" then developed a study proposal to provide the information required to accurately determine the effects of increasing the pronghorn habitat and study any alternative means of achieving these objectives. An individual study was then proposed by the committee to: 1. Study the movement of livestock and pronghorn through different sizes and types of fence modifications, and 2. Determine the size of an area and other habitat requirements needed to support a viable herd of pronghorn on public lands in the BLM, Roswell District. A viable herd was defined as a herd where recruitment equals mortality. It was anticipated that the performance period for the research would take approximately 4 years. The study was to begin no earlier than December 1, 1978, and be completed by September 30, 1982.

Methodology. The 4-year study was conducted in 18 study pastures approximately 12 to 45 miles northwest and southwest of Roswell, New Mexico. Pastures in this area varied in size from about 4 to 27 sections all enclosed with net wire. This area is generally characterized as a short grass prairie with topography varying from flat prairies to rolling hills progressing to rugged limestone hills and canyons.

This study involved 2 distinct tasks conducted concurrently. Task I involved approximately 270 pronghorn on 36,000 acres to provide data on the movement of livestock and pronghorn through different sizes and types of fence modifications. Task II involved 300 pronghorn on 95,360 acres to determine the size of area needed to support a viable herd of pronghorn within the study area. In Task I, 3 ranches were involved with the fence modifications. These included the J. Gist Ranch, the Circle F Ranch and the S.P. Johnson Ranch. Ten fence modifications or passes were located on the Gist Ranch and consisted of 4-strand barbed wire and were 50 to 100 yards long. The top strand was approximately 43 inches high and the bottom strand about 16 inches above the ground. Two fence modifications were located on the Circle F Ranch. Both passes were composed of 3 top strands of barbed wire and 1 bottom strand of smooth wire. The top strand was 43 inches high and the bottom strand was 12 inches off the ground. The S.P. Johnson Ranch contained a "Paul's Pass" as described by Russell (1951).

Off-site fence tests were conducted at New Mexico State University. Four vertical panel structures and 1 horizontal grill were selected for tests involving livestock. In all trial situations, animals (cattle and sheep) under test were placed opposite of a test panel with some stress factor placed on the other side. The structure of the study enclosure allowed tests to be conducted independently and animals under stress to have maximum exposure to each test panel.

Three stress situations were selected and applied to both cattle and sheep. These stress situations included male-female stress, female-water stress and female-unweaned young stress. Lambs used in the ewe-lamb trial ranged from 4 to 7 weeks of age while calves used in the cow-calf trial were approximately 3 months of age.

To initiate Task II, the New Mexico Department of Game and Fish along with the BLM captured a total of 309 pronghorns using capture techniques described by Russell (1964). Trapping operations began on January 15, 1979, and the last animals were released on March 10, 1979. Pronghorns were stocked in each pasture at a density of 2 per seciton and at a sex ratio of 1 male per 3 females. All animals to be released into the study area were sexed and fitted with vinyl-coated nylon collars.

Monthly inventories of pronghorn populations were conducted through aerial censuses in both tasks. Total herd numbers, natality, mortality, survival, immigration and emigration were assessed. During April and May of each year no aerial surveys were taken so as not to disturb the ewes or does while lambing fawning.

The procedures used in the vegetation sampling followed closely the procedures outlined in the Soil-Vegetation-Inventory Methods (SVIM) outlined by the Bureau of Land Management. Initially all the study pastures were mapped into range sites following descriptions presented by the Soil Conservation Service (1967). Basal cover was determined by the step-point method (Evans and Love 1957). Each transect consisted of 100 points. Herbage standing crop was determined by the weight estimate method (Pechanic and Pickford 1937, Wilm, Costello, and Klipple 1944) with (.25 mi.) circular quadrats. Herbage standing crop was estimated in all pastures during January, March, June, and September. These data were utilized to calculate preference indices for the 3 classes of herbivores and in the analyses of pronghorn habitats.

Fecal samples were collected on a seasonal basis (January, March, June, September) for all Task II pastures and 1 Task I pasture. A sample of 12 fecal groups per species for all pastures was attempted each season.

Michrohistological examinations (Baumgartner and Martin 1939, Dusi 1949) were conducted on each fecal group to determine the vegetative diet. Diet similarities, comparing species rather than general forage classes, were made using Kulczinski's index (Oosting 1956). The resulting indices were tested for pasture and season effects.

In order to organize the data on numbers of pronghorn in each study pasture over time collected from overlights, years were divided into 3-month seasons beginning in March, June, September, and December. Numbers of collared males and females, uncollared males and females, and fawns at the beginning of each season in each pasture were determined from the maximum number of individuals in each category seen during the season and in subsequent months.

Descriptive information which did not vary over the time of the study was tabulated by pasture and included pasture size, an index to latitude, ruggedness index, vegetation type, percent of climax vegetation, SCS and SVIM estimates of annual forb, grass, and shrub production, and a dummy variate for BLM designation of suitability for pronghorns (good or bad).

The final report and many records are available for review at the Roswell District Office, Roswell, New Mexico.

APPENDIX E-3

THREATENED AND ENDANGERED ANIMAL AND PLANT SPECIES

Common Name	Scientific Name	Status	Location
FEDERAL SPECIES			
Animal			
Black footed ferret a/	Mustela nigripes	Group I b/	Roosevelt, Curry
Peregrine falcon a/	Falco peregrinus anatum	Group I	Chaves, Lincoln
Bald eagle a/	Haliaeetus leucocephalus	Group II	Chaves, Lincoln DeBaca, Quay, Guadalupe
Bluntnosed shiner	Notropis Simus	Proposed	De Baca
Pecos gambusia a/	Gambusia nobilis	Group II	DeBaca, Chaves
Plant			
Kuenzler hedgehog cactus	Echinocereus fendleri var. kuenzleri	Endangered	Chaves, Lincoln
Desert rose	Rosa stellata	Candidate	Lincoln
Panhandle euphorbia	Euphorbia strictior	Candidate	Quay
STATE SPECIES			
Animal			
Tularosa Black-tailed Prairie dog	Cynomys ludovicianus	Group II c/	Lincoln
Mississippi kite	Ictinia mississippiensis	Group II	Chaves, Curry, Roosevelt
Least tern	Sterna antillarum	Group II	Chaves
Gray vireo	Vireo vicinior	Group II	Lincoln
Baird's sparrow	Ammodramus bairdii	Group II	Chaves, Lincoln
McCown's longspur	Calcarius mccowni	Group II	Chaves, Roosevelt
River cooter	Pseudemys concinna	Group II	Chaves
Sanddune sagebrush lizard	Sceloporus graciosus arenicolus	Group II	
Plainbelly water snake	Nerodia erythrogaster	Group II	Eddy, Lea
Trans-pecos rat snake	Elaphe subocularis	Group II	Chaves, Lincoln
(Pecos) western ribbon snake	Thamnophis proximus diabolicus	Group II	Quay, Curry, DeBaca, Chaves, Roosevelt
Sacramento mountain salamander	Plethodon neomexicana	Group II	Lincoln
Eastern barking frog	Hylactophryne augusti latrans	Group II	Chaves
Gray redhorse	Moxostoma congestum	Group I	Chaves
Arkansas river shiner	Notropis girardi	Group I	Quay
Mexican tetra	Astyanax mexicanus	Group II	Guadalupe, DeBaca, Chaves
Bluntnosed shiner	Notropis simus pecosensis	Group II	DeBaca, Chaves

Appendix E-3 (continued)

Common Name	Scientific Name	Status	Location
Suckermouth minnow	Phenacobius mirabilis	Group II	DeBaca, Quay, Guadalupe
Mississippi silvery minnow	Hybognathus nuchalis	Group II	DeBaca, Chaves, Guadalupe
Speckled chub	Hybopsis aestivalis tetranemus	Group II	Quay
Bigscale logperch	Percina macrolepida	Group II	DeBaca, Chaves, Guadalupe
Greenthroat darter	Etheostoma lepidum	Group II	Chaves
Pecos assiminea	Assiminea spp.	Group I	Chaves
Roswell spring snail	Fontlicella spp.	Group I	Chaves
Pope's mussel	Popenaias popei	Group I	Chaves
Pecos spring snail	Fontelicella spp.	Group II	Eddy
Koster's spring snail	Tryonia spp.	Group II	Chaves
Say's pond snail	Lymnaea caperata	Group II	unknown
New Mexico ramshorn snail	Planorbidae spp.	Group II	unknown
Plant			
Bigtooth maple	Acer grandidentatum	Special Concern	d/ Lincoln
Gyp ringstem	Anulocaulis gypsogenus	Special Concern	Chaves
Rock spleenwort	Asplenium resiliens	Special Concern	Lincoln
New Mexico Astragalus	Astragalus neomexicanus	Special Concern	Lincoln
Guadalupe milkvetch	Astragalus pictiformis	Special Concern	Chaves
Brickelbush	Brickellia modesta	Special Concern	Lincoln
Indian paintbrush	Castilleja wootonii	Special Concern	Lincoln
	Cirsium inoratum	Special Concern	Lincoln
	Circaea alpinai	Special Concern	Lincoln
Striped coralroot	Corallorhiza striata var striata	Special Concern	Lincoln
Kuenzler Hedgehog cactus	Echinocereus fenderi var kuenzleri	Special Concern	Lincoln
Common button cactus	Epithelantha micromeris	Special Concern	Lincoln
Panhandle euphorbia	Euphorbia strictior	Special Concern	Quay
Snowy prairie-gentian	Eustoma grandiflorum	Special Concern	Guadalupe
Bog orchid	Habenaria sparsiflora var brevifolia	Special Concern	Lincoln
	Hedeoma costatum	Special Concern	Lincoln
False pennyroyal	Hedeoma pulcherrima	Special Concern	Lincoln
Gyp sunflower	Helianthus paradoxus	Special Concern	
Dedberry juniper	Juniperus pinchotii	Special Concern	
	Justicia wrightii	Special Concern	Chaves
Golden bladderpod	Lesquerella aurea	Special Concern	Lincoln
Scaly bladderpod	Lesquerella valida	Special Concern	Lincoln
California sealavender	Limonium limbatum	Special Concern	Chaves, Lincoln Guadalupe
Lupine	Lupinus aquilinus	Special Concern	Lincoln
White Mountain Lupine	Lupinus sierrae-blancae	Special Concern	Lincoln
Stickleaf	Mentzelia perennis	Special Concern	Lincoln
Nama	Nama foilosum	Special Concern	Chaves

Appendix E-3 (continued)

Common Name	Scientific Name	Status	Location
Davis cholla	Opuntia davisii	Special Concern	Curry, Chaves, Roosevelt, Quay
Royal beardstongue	Penstemon cardinalis var cardinalis	Special Concern	Lincoln
Scorpionweed	Phacelia depauperata	Special Concern	Chaves
Scorpionweed	Phacelia intermedia	Special Concern	Lincoln
Scorpionweed	Phacelia rupestris	Special Concern	Chaves
Silvercup mockorange	Philadelphis argyrocalyx	Special Concern	Lincoln
Thurber pilostyles	Pilostyles thurberi	Special Concern	Quay, Guadalupe
Primrose	Primula ellisiae	Special Concern	Lincoln
Desert rose	Rosa stellata	Special Concern	Lincoln
Figwort	Scrophularia montana	Special Concern	Lincoln
Ladiestresses	Spiranthes parasitica	Special Concern	Lincoln
	Tetradymia filiofolia	Special Concern	Lincoln
Wright spiderwort	Tradescantia wrightii	Special Concern	Lincoln
Texas valerian	Valeriana texana	Special Concern	Lincoln
Zephyr Lily	Zephyranthes longifolia	Special Concern	Guadalupe

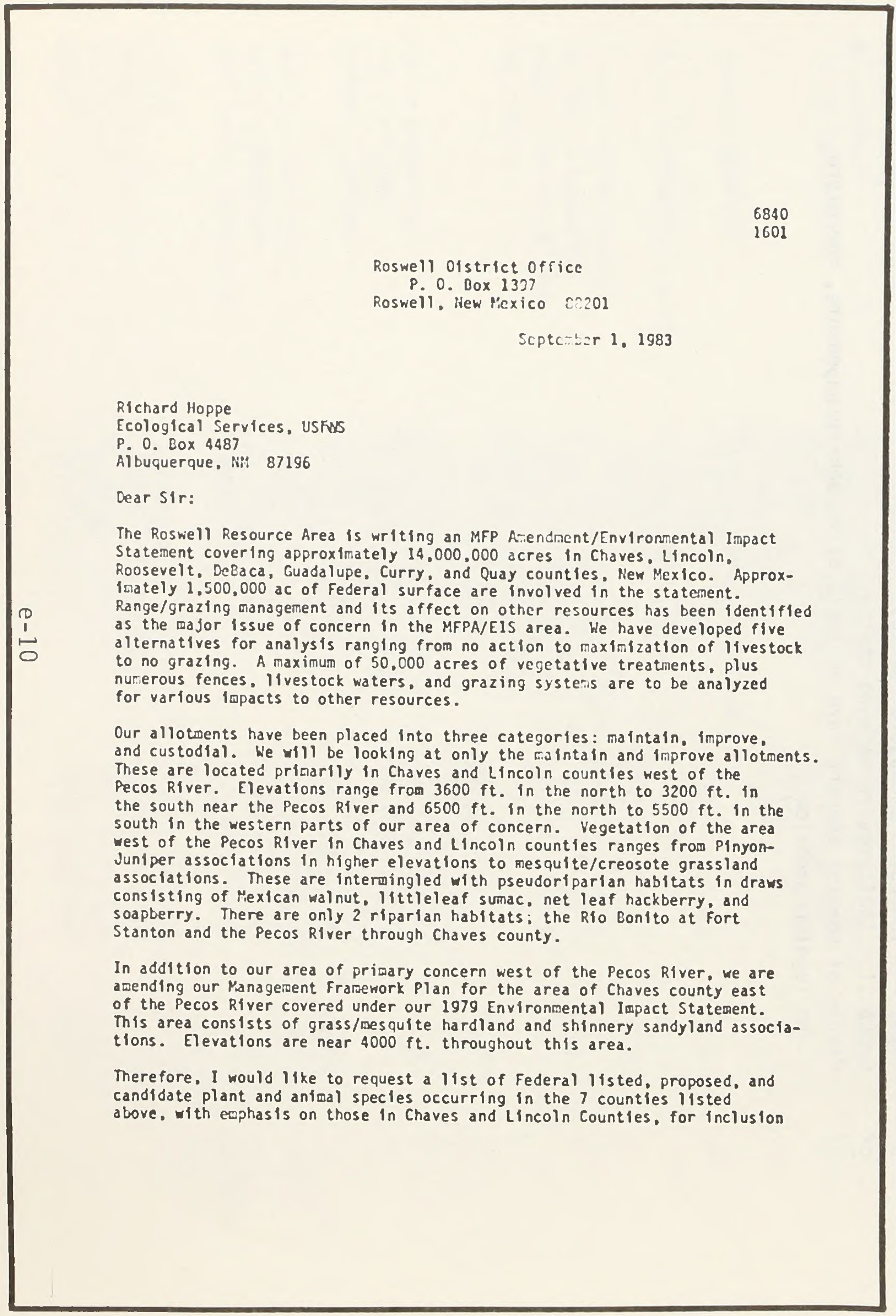
Source: U.S. Fish and Wildlife Service, New Mexico Department of Game & Fish, New Mexico Historical Conservation Program

a/ These species are also on the Federal endangered species list but were not selected by USFWS for analysis in this document.

b/ Group I - indicates endangered status

c/ Group II - Indicates threatened status

d/ Plants of special concern have no legislative acknowledgements, therefore no legal protection



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Roswell District Office
P. O. Box 1397
Roswell, New Mexico 88201

September 1, 1983

Richard Hoppe
Ecological Services, USFWS
P. O. Box 4487
Albuquerque, NM 87196

Dear Sir:

The Roswell Resource Area is writing an MFP Amendment/Environmental Impact Statement covering approximately 14,000,000 acres in Chaves, Lincoln, Roosevelt, DeBaca, Guadalupe, Curry, and Quay counties, New Mexico. Approximately 1,500,000 ac of Federal surface are involved in the statement. Range/grazing management and its affect on other resources has been identified as the major issue of concern in the MFPA/EIS area. We have developed five alternatives for analysis ranging from no action to maximization of livestock to no grazing. A maximum of 50,000 acres of vegetative treatments, plus numerous fences, livestock waters, and grazing systems are to be analyzed for various impacts to other resources.

Our allotments have been placed into three categories: maintain, improve, and custodial. We will be looking at only the maintain and improve allotments. These are located primarily in Chaves and Lincoln counties west of the Pecos River. Elevations range from 3600 ft. in the north to 3200 ft. in the south near the Pecos River and 6500 ft. in the north to 5500 ft. in the south in the western parts of our area of concern. Vegetation of the area west of the Pecos River in Chaves and Lincoln counties ranges from Pinyon-Juniper associations in higher elevations to mesquite/creosote grassland associations. These are intermingled with pseudoriparian habitats in draws consisting of Mexican walnut, littleleaf sumac, net leaf hackberry, and soapberry. There are only 2 riparian habitats; the Rio Bonito at Fort Stanton and the Pecos River through Chaves county.

In addition to our area of primary concern west of the Pecos River, we are amending our Management Framework Plan for the area of Chaves county east of the Pecos River covered under our 1979 Environmental Impact Statement. This area consists of grass/mesquite hardland and shinnery sandyland associations. Elevations are near 4000 ft. throughout this area.

Therefore, I would like to request a list of Federal listed, proposed, and candidate plant and animal species occurring in the 7 counties listed above, with emphasis on those in Chaves and Lincoln Counties, for inclusion

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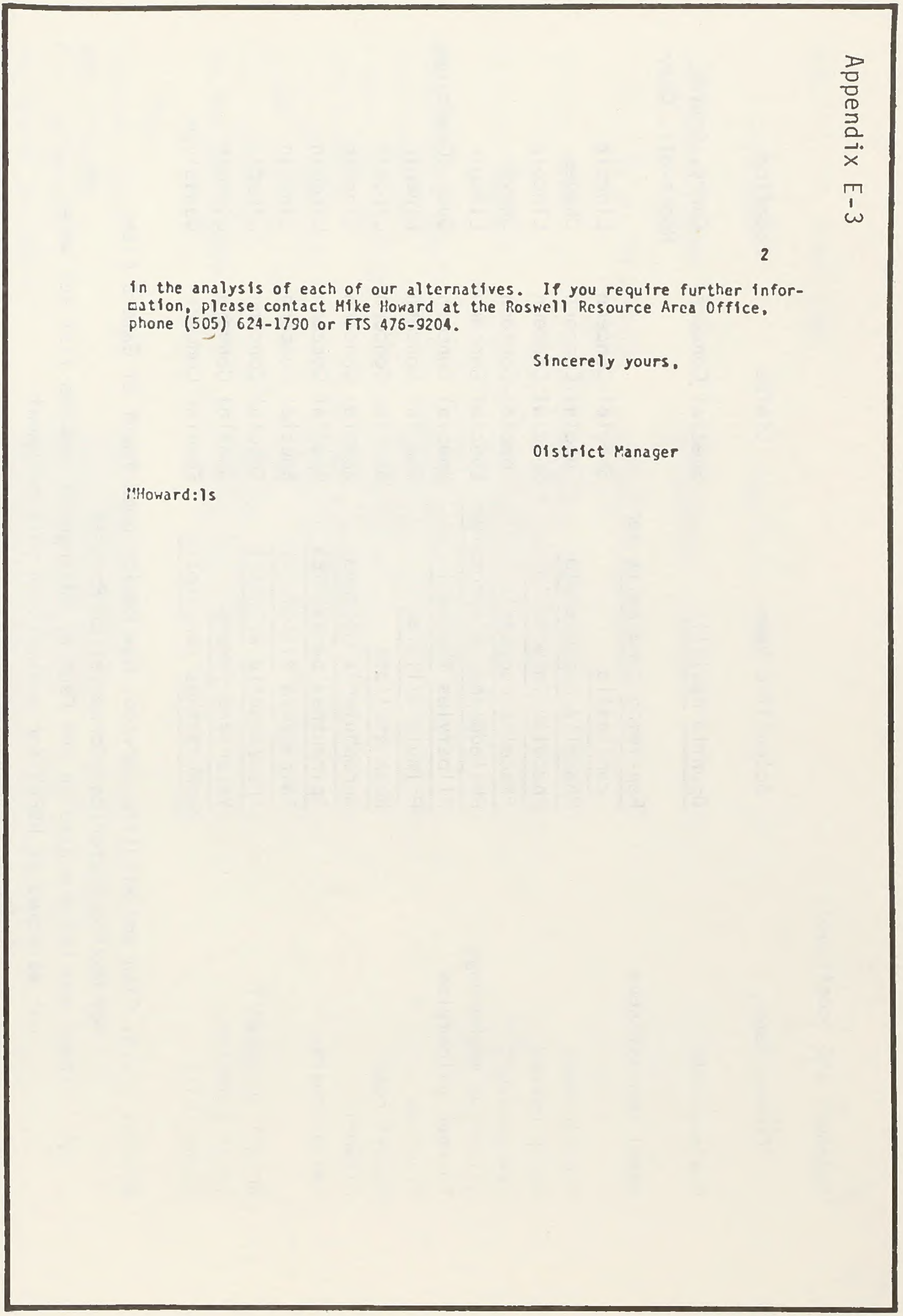

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in the analysis of each of our alternatives. If you require further information, please contact Mike Howard at the Roswell Resource Area Office, phone (505) 624-1790 or FTS 476-9204.

Sincerely yours,

District Manager

MHoward:ls

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Field Supervisor
Ecological Services, USFWS
Post Office Box 4487
Albuquerque, New Mexico 87196

Cons. 02-22-83-1-092

September 8, 1983

Memorandum

To: District Manager, Bureau of Land Management, Roswell, New Mexico

From: Field Supervisor, FWS, Ecological Services, Albuquerque, New Mexico

Subject: BLM's MFP Amendment/EIS, Roswell Resource Area

This is in response to your letter dated Septmeber 1, 1983 concerning the above subject. As provided by Section 7 of the Endangered Species Act, the Fish and Wildlife Service furnishes, upon request, a list of Federally listed and proposed species that may be affected by Federal actions. This office has used the information in your request to narrow the list of species which may occur in Chaves, Lincoln, Roosevelt, De Baca, Guadalupe, Curry and Quay Counties, New Mexico, to those that potentially may be affected by your proposed action., We find the following species may be present in your project area.

Chaves County - Kuenzler hedgehog cactus, bluntnose shiner
Lincoln County - Kuenzler hedgehog cactus, *Rosa stellata*
Roosevelt County - none
De Baca County - bluntnose shiner
Guadalupe County - none
Curry County - none
Quay County - *Euporbia strictor*
See enclosure

If your action significantly affects the quality of the human environment, your agency should conduct a biological assessment to determine whether or not the action will affect listed or proposed species. Preparation of the assessment may begin upon receipt of the Fish and Wildlife Service's species list.

BUREAU OF LAND MANAGEMENT
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SEP 13 1983
ROSWELL, NEW MEXICO

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The biological assessment shall be completed within 180 days after receipt of the species list, unless it is mutually agreed to extend this period. If the assessment is not initiated within 90 days after receipt of the species list, I suggest its accuracy be verified before conducting the assessment.

The biological assessment should include as a minimum:

1) onsite inspection of the area affected by the proposed activity or program, including a detailed survey of the area to determine if species are present and whether suitable habitat exists for either expanding the existng population or potential reintroductions of populations;

2) interviews with recognized experts on the species at issue, including personnel of the Fish and Wildlife Service, State conservation departments, universities, and others who may have data not yet found in scientific literature;

3) review literature and other scientific data to determine the species distribution, habitat needs, and other biological requirements;

4) review and analysis of the effects of the proposed action on individuals and populations, including consideration of both direct and indirect effects of the proposal on the species and its habitat;

5) analysis of alternative actions that may promote conservation of the species;

6) other relevant information;

7) written report documenting the assessment results.

If the Federal permitting action does not significantly affect the quality of the human environment, there is no need to prepare a biological assessment. However, it remains incumbent upon the Federal agency to assess whether its action may affect endangered and threatened species.

If the Federal agency determines that its proposed action may affect listed species, the Federal agency shall initiate the formal Section 7 consultation process by writing the Field Supervisor, U.S. Fish and Wildlife Service, P.O. Box 4487, Albuquerque, New Mexico 87196. If no effect is evident, there is no need for further consultation. However, I would appreciate the opportunity to review your biological assessment.

Candidate species include those listed in a "Notice of Review" in the "Federal Register" but later withdrawn, those species which are in the process of being listed, or those which are the subject of contracted status surveys. Candidate species have no legal protection under the Endangered Species Act.

If you have need of further assistance, please call this office at Comm. (505) 766-3966 or FTS 474-3966.

Sincerely yours,

John C. Peterson

Enclosure

cc: (w/cy encl)
Regional Director, FWS, HR, SE, Albuquerque, New Mexico

BLM MFP/EIS amendment Roswell Resource Area, New Mexico

Listed Species

1. Kuenzler Hedgehog Cactus Echinocereus kuenzleris

This plant is found in northeast Otero and adjacent Chaves and on gently sloping limestone outcrops in pinyon-juniper woodlands at 5,800 to 6,200 feet elvation. Authority: Sako, D. and W. Wagner. 1977. Status report on Echinocereus kuenzleri. U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

Candidate Species

1. Bluntnose shiner Notropis simus

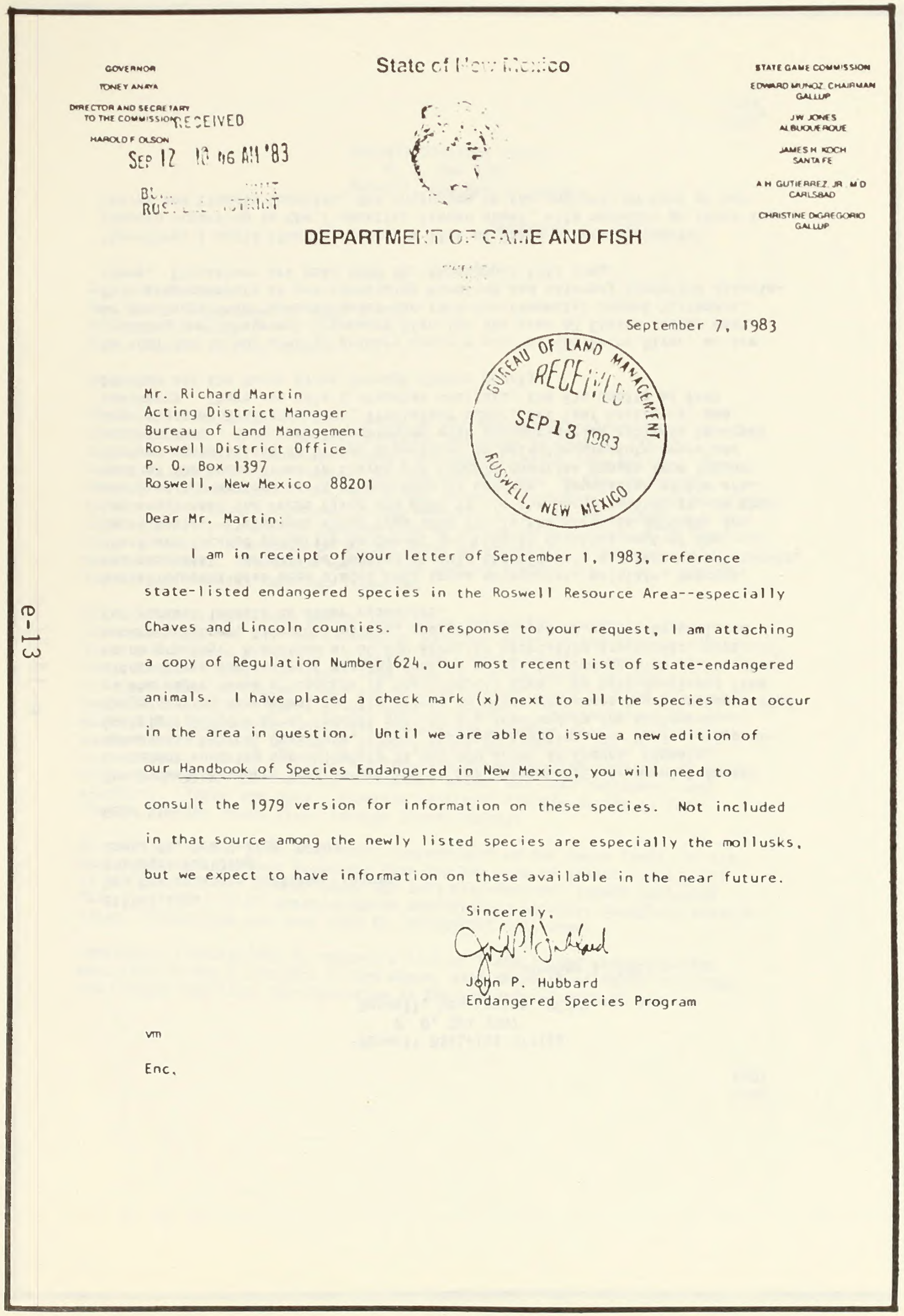
Present distribution is in the Pecos River from Santa Rosa to Artesia, N.M. in Chaves, De Baca and Eddy counties. The Fish and Wildlife Service has prepared a listing package for the bluntnose shiner which proposes it as a threatened species. This package also proposes critical habitat for the bluntnose shiner in two sections of the Pecos River. One begins approximately 16 km south of Fort Sumner, De Baca County (T.1N., R.26E., SE 1/4 Sec. 2) and extends approximately 56 km further downstream into Chaves County (T.5S., R.25E., SW 1/4 Sec. 35k). The second area is approximately 30 km long, between Hagerman (T.14S., R.27E., NW 1/4 Sec. 7) and Artesia (T.17S., R.27E., SW 1/4 Sec. 18).

2. Rosa stellata

This plant is found on dry rocky slopes at 5,000 to 7,000 feet elevation.

3. Euphorbia strictor

This plant has been found between Logan and Nara Visa, New Mexico, in grassland, shrub areas.



GOVERNOR
TONEY ANAYA
DIRECTOR AND SECRETARY TO THE COMMISSION
HAROLD F OLSON

State of New Mexico

DEPARTMENT OF GAME AND FISH

STATE GAME COMMISSION
EDWARD MUNOZ, CHAIRMAN
GALLUP
J.W. JONES
ALBUQUERQUE
JAMES H. KOCH
SANTA FE
A.H. GUTIERREZ, JR., M.D.
CARLSBAD
CHRISTINE DIGREGORIO
GALLUP

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September 7, 1983

BUREAU OF LAND MANAGEMENT
RECEIVED
SEP 13 1983
ROSWELL, NEW MEXICO

Mr. Richard Martin
Acting District Manager
Bureau of Land Management
Roswell District Office
P. O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Martin:

I am in receipt of your letter of September 1, 1983, reference state-listed endangered species in the Roswell Resource Area--especially Chaves and Lincoln counties. In response to your request, I am attaching a copy of Regulation Number 624, our most recent list of state-endangered animals. I have placed a check mark (x) next to all the species that occur in the area in question. Until we are able to issue a new edition of our Handbook of Species Endangered in New Mexico, you will need to consult the 1979 version for information on these species. Not included in that source among the newly listed species are especially the mollusks, but we expect to have information on these available in the near future.

Sincerely,

John P. Hubbard
Endangered Species Program

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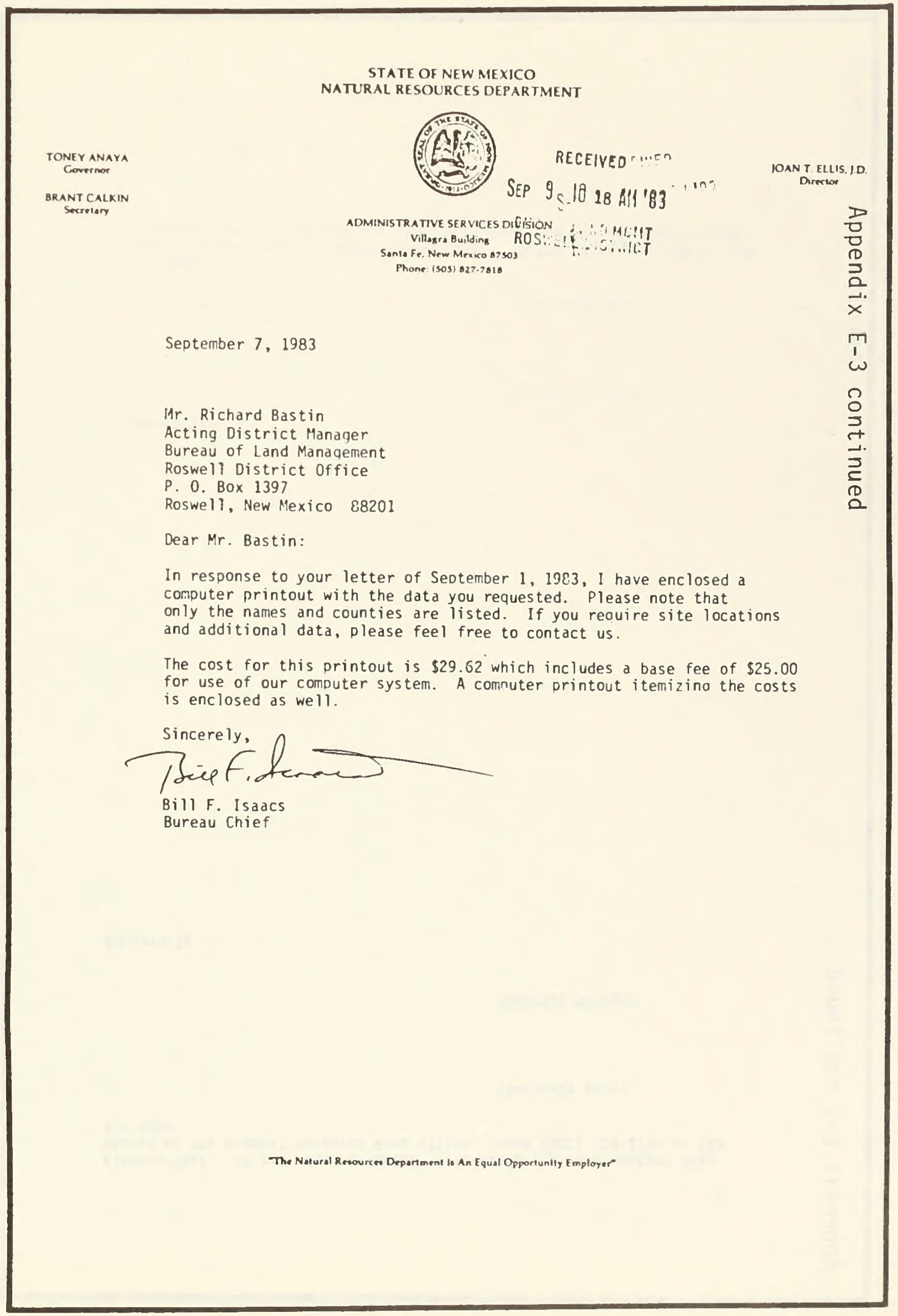
Enc.



STATE OF NEW MEXICO
NATURAL RESOURCES DEPARTMENT

TONEY ANAYA
Governor

BRANT CALKIN
Secretary

JOAN T. ELLIS, J.D.
Director

ADMINISTRATIVE SERVICES DIVISION
Villagra Building
Santa Fe, New Mexico 87503
Phone: (505) 827-7818

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ROSWELL DISTRICT

September 7, 1983

Mr. Richard Bastin
Acting District Manager
Bureau of Land Management
Roswell District Office
P. O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Bastin:

In response to your letter of September 1, 1983, I have enclosed a computer printout with the data you requested. Please note that only the names and counties are listed. If you require site locations and additional data, please feel free to contact us.

The cost for this printout is $29.62 which includes a base fee of $25.00 for use of our computer system. A computer printout itemizing the costs is enclosed as well.

Sincerely,

Bill F. Isaacs

Bill F. Isaacs
Bureau Chief

"The Natural Resources Department Is An Equal Opportunity Employer"

6840
1601

Roswell District Office
P. O. Box 1397
Roswell, New Mexico 88201

September 1, 1983

Bill Isaacs
New Mexico State Heritage Program
Villagra Building
Santa Fe, New Mexico 87503

Dear Sir:

The Roswell Resource Area is writing an MFP Amendment/Environmental Impact Statement covering approximately 14,000,000 acres in Chaves, Lincoln, Roosevelt, DeBaca, Guadalupe, Curry, and Quay counties, New Mexico. Approximately 1,500,000 ac of Federal surface are involved in the statement. Range/grazing management and its affect on other resources has been identified as the major issue of concern in the MFPA/EIS area. We have developed five alternatives for analysis ranging from no action to maximization of livestock to no grazing. A maximum of 50,000 acres of vegetative treatments, plus numerous fences, livestock waters, and grazing systems are to be analyzed for various impacts to other resources.

Our allotments have been placed into three categories: maintain, improve, and custodial. We will be looking at only the maintain and improve allotments. These are located primarily in Chaves and Lincoln counties west of the Pecos River. Elevations range from 3600 ft. in the north to 3200 ft. in the south near the Pecos River and 6500 ft. in the north to 5500 ft. in the south in the western parts of our area of concern. Vegetation of the area west of the Pecos River in Chaves and Lincoln counties ranges from Pinyon-Juniper associations in higher elevations to mesquite/creosote grassland associations. These are intermingled with pseudoriparian habitats in draws consisting of Mexican walnut, littleleaf sumac, net leaf hackberry, and soapberry. There are only 2 riparian habitats; the Rio Bonito at Fort Stanton and the Pecos River through Chaves county.

In addition to our area of primary concern west of the Pecos River, we are amending our Management Framework Plan for the area of Chaves county east of the Pecos River covered under our 1979 Environmental Impact Statement. This area consists of grass/mesquite hardland and shinnery sandyland associations. Elevations are near 4000 ft. throughout this area.

Therefore, I would like to request a list of State plants of special concern occurring in the 7 counties listed above, with emphasis on those in Chaves and Lincoln Counties, for inclusion in the analysis of each of our

---

2

alternatives. If you require further information, please contact Mike Howard at the Roswell Resource Area Office, phone (505) 624-1790 or FTS 476-9204.

Sincerely yours,

District Manager

MHoward:ls

6840
1601

Roswell District Office
P. O. Box 1397
Roswell, New Mexico 88201

September 1, 1983

Dr. John Hubbard
New Mexico Department of Game & Fish
Villagra Building
Santa Fe, New Mexico 87503

Dear Sir:

The Roswell Resource Area is writing an MFP Amendment/Environmental Impact Statement covering approximately 14,000,000 acres in Chaves, Lincoln, Roosevelt, DeBaca, Guadalupe, Curry, and Quay counties, New Mexico. Approximately 1,500,000 ac of Federal surface are involved in the statement. Range/grazing management and its affect on other resources has been identified as the major issue of concern in the MFPA/EIS area. We have developed five alternatives for analysis ranging from no action to maximization of livestock to no grazing. A maximum of 50,000 acres of vegetative treatments, plus numerous fences, livestock waters, and grazing systems are to be analyzed for various impacts to other resources.

Our allotments have been placed into three categories: maintain, improve, and custodial. We will be looking at only the maintain and improve allotments. These are located primarily in Chaves and Lincoln counties west of the Pecos River. Elevations range from 3600 ft. in the north to 3200 ft. in the south near the Pecos River and 6500 ft. in the north to 5500 ft. in the south in the western parts of our area of concern. Vegetation of the area west of the Pecos River in Chaves and Lincoln counties ranges from Pinyon-Juniper associations in higher elevations to mesquite/creosote grassland associations. These are intermingled with pseudoriparian habitats in draws consisting of Mexican walnut, littleleaf sumac, net leaf hackberry, and soapberry. There are only 2 riparian habitats; the Rio Bonito at Fort Stanton and the Pecos River through Chaves county.

In addition to our area of primary concern west of the Pecos River, we are amending our Management Framework Plan for the area of Chaves county east of the Pecos River covered under our 1979 Environmental Impact Statement. This area consists of grass/mesquite hardland and shinnery sandyland associations. Elevations are near 4000 ft. throughout this area.

Therefore, I would like to request a list of State listed animal species occurring in the 7 counties listed above, with emphasis on those in Chaves and Lincoln Counties, for inclusion in the analysis of each of our

alternatives. If you require further information, please contact Mike Howard at the Roswell Resource Area Office, phone (505) 624-1790 or FTS 476-9204.

Sincerely yours,

District Manager

MHoward:ls

March 3 1849

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Roswell District Office
P. O. Box 1397
Roswell, New Mexico 88201

IN REPLY REFER TO:
6840
1601

March 8, 1984

MEMORANDUM

TO: Field Supervisor, FWS, Ecological Services, Albq, New Mexico

FROM: District Manager, BLM, Roswell District, Roswell, New Mexico

SUBJECT: BLM's MFP Amendment/EIS, Roswell Resource Area

The BLM, on September 1, 1983, initiated informal consultation requirements pursuant to Section 7 of the Endangered Species Act of 1973, as amended, for the Roswell Resource Area MFP Amendment/EIS. Our memorandum of that date requested the current list of threatened or endangered animal and plant species that may occur within the subject MFP Amendment/EIS area.

Your response, received September 13, 1983, to our request contained the following species which may be present in our planning area:

Kuenzler hedgehog cactus
Rosa stellata
Euphorbia strictor
Bluntnose shiner

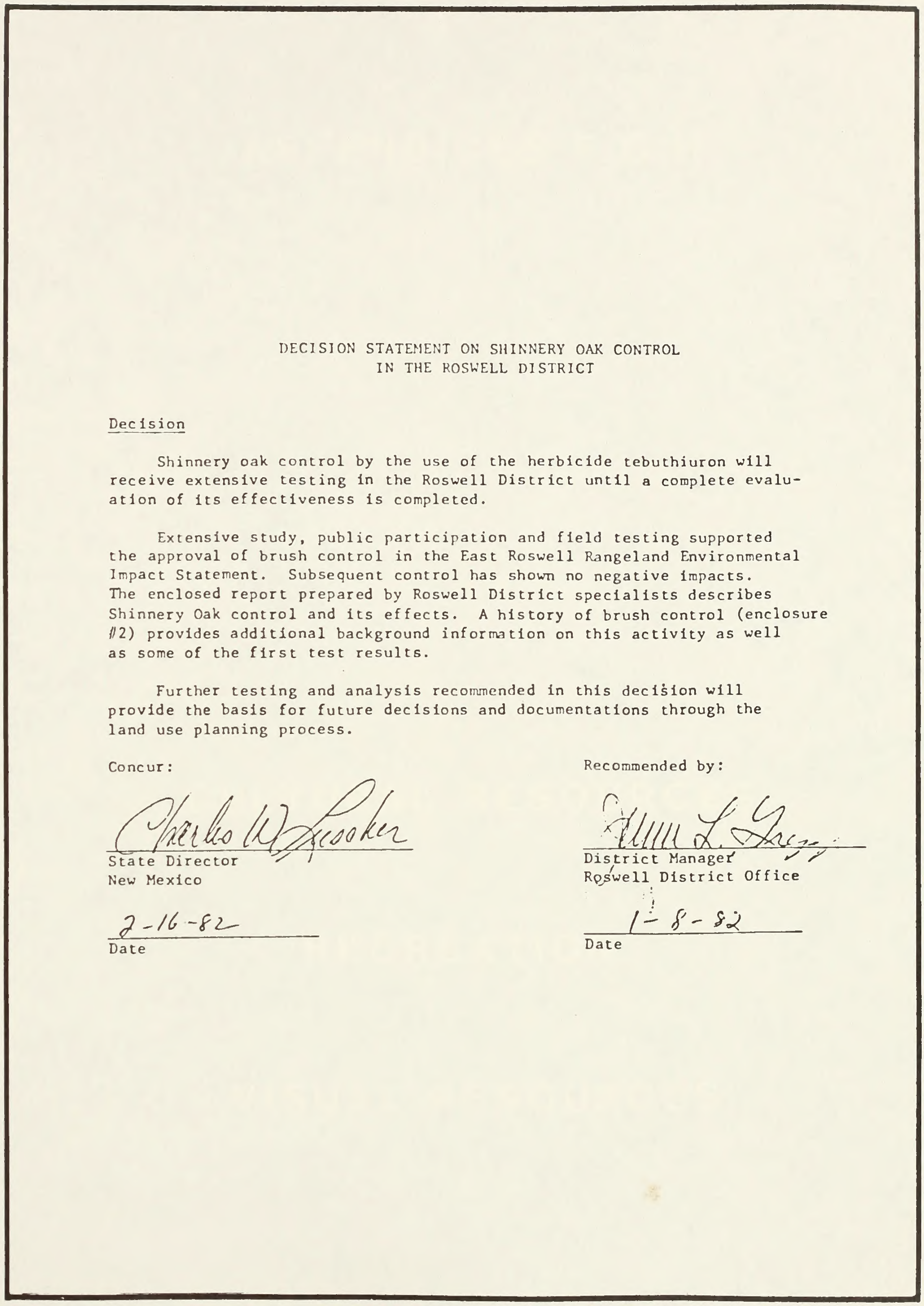
Your memorandum stated that a biological assessment for the purpose of identifying listed and proposed species which are likely to be affected by the proposed action shall be completed within 180 days after receipt of the species list. The BLM has completed this biological assessment and, based on findings contained in the document, has determined that there will be no affect, resultant from the Roswell Resource Area Amendment/EIS on the listed species.

The biological assessment will be included in the final EIS document. If you require additional information, please contact Linda Rundell at (505) 624-1790, Roswell Resource Area office.

Earl R Cunningham

Appendix E-4

Decision Statement on Shinnery Oak Control



DECISION STATEMENT ON SHINNERY OAK CONTROL
IN THE ROSWELL DISTRICT

Decision

Shinnery oak control by the use of the herbicide tebuthiuron will receive extensive testing in the Roswell District until a complete evaluation of its effectiveness is completed.

Extensive study, public participation and field testing supported the approval of brush control in the East Roswell Rangeland Environmental Impact Statement. Subsequent control has shown no negative impacts. The enclosed report prepared by Roswell District specialists describes Shinnery Oak control and its effects. A history of brush control (enclosure #2) provides additional background information on this activity as well as some of the first test results.

Further testing and analysis recommended in this decision will provide the basis for future decisions and documentations through the land use planning process.

Concur:

Charles W. Luscher
State Director
New Mexico

2-16-82
Date

Recommended by:

District Manager
Roswell District Office

1-8-82
Date

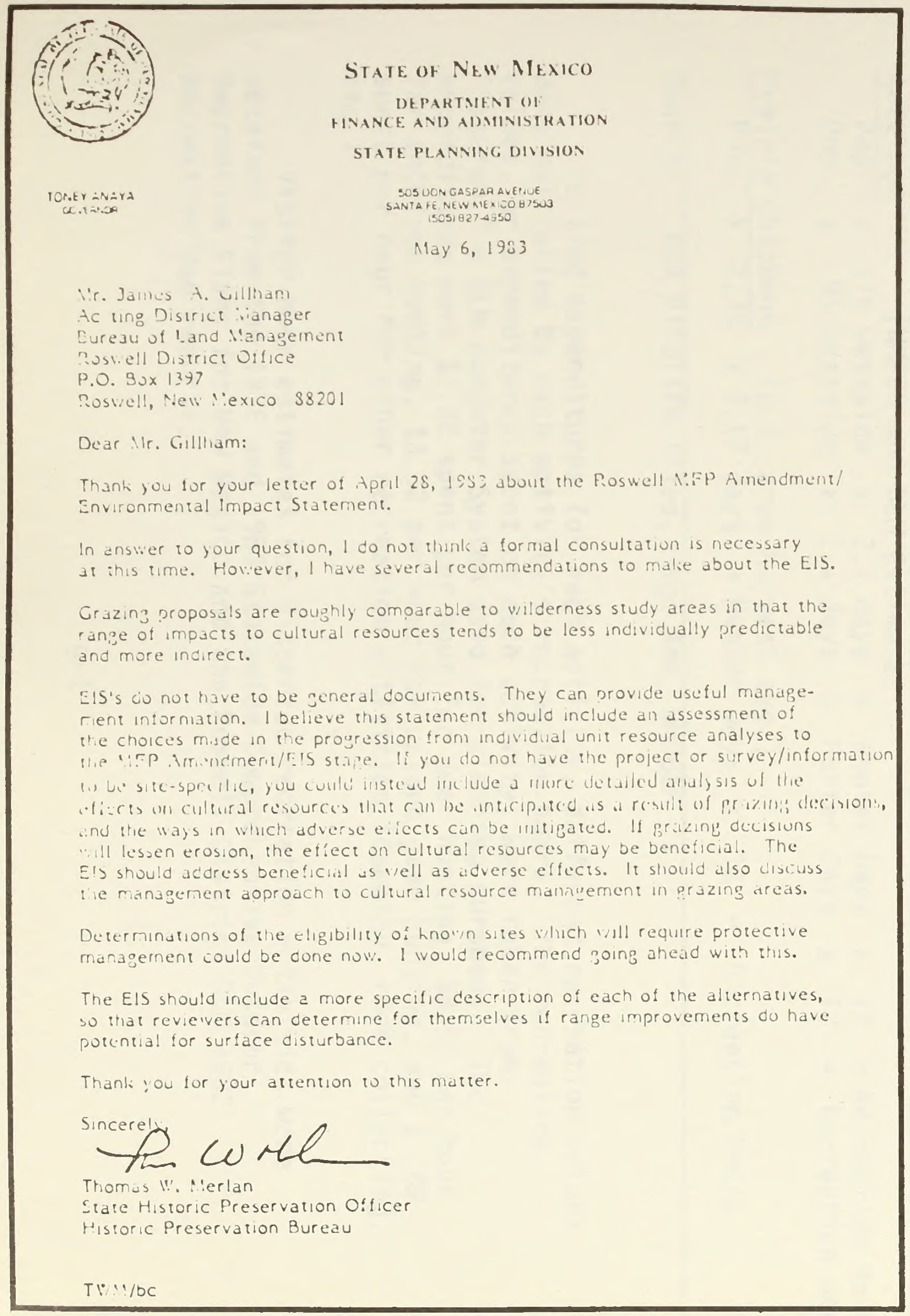
APPENDICES F,G,H

CULTURAL RESOURCES

RECREATION

VISUAL RESOURCES

Appendix F



STATE OF NEW MEXICO
DEPARTMENT OF
FINANCE AND ADMINISTRATION
STATE PLANNING DIVISION

TONEY ANAYA
GOVERNOR

505 DON GASPAR AVENUE
SANTA FE, NEW MEXICO 87503
(505) 827-4950

May 6, 1983

Mr. James A. Gillham
Acting District Manager
Bureau of Land Management
Roswell District Office
P.O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Gillham:

Thank you for your letter of April 28, 1983 about the Roswell MFP Amendment/ Environmental Impact Statement.

In answer to your question, I do not think a formal consultation is necessary at this time. However, I have several recommendations to make about the EIS.

Grazing proposals are roughly comparable to wilderness study areas in that the range of impacts to cultural resources tends to be less individually predictable and more indirect.

EIS's do not have to be general documents. They can provide useful management information. I believe this statement should include an assessment of the choices made in the progression from individual unit resource analyses to the MFP Amendment/EIS stage. If you do not have the project or survey/information to be site-specific, you could instead include a more detailed analysis of the effects on cultural resources that can be anticipated as a result of grazing decisions, and the ways in which adverse effects can be mitigated. If grazing decisions will lessen erosion, the effect on cultural resources may be beneficial. The EIS should address beneficial as well as adverse effects. It should also discuss the management aoproach to cultural resource management in grazing areas.

Determinations of the eligibility of known sites which will require protective management could be done now. I would recommend going ahead with this.

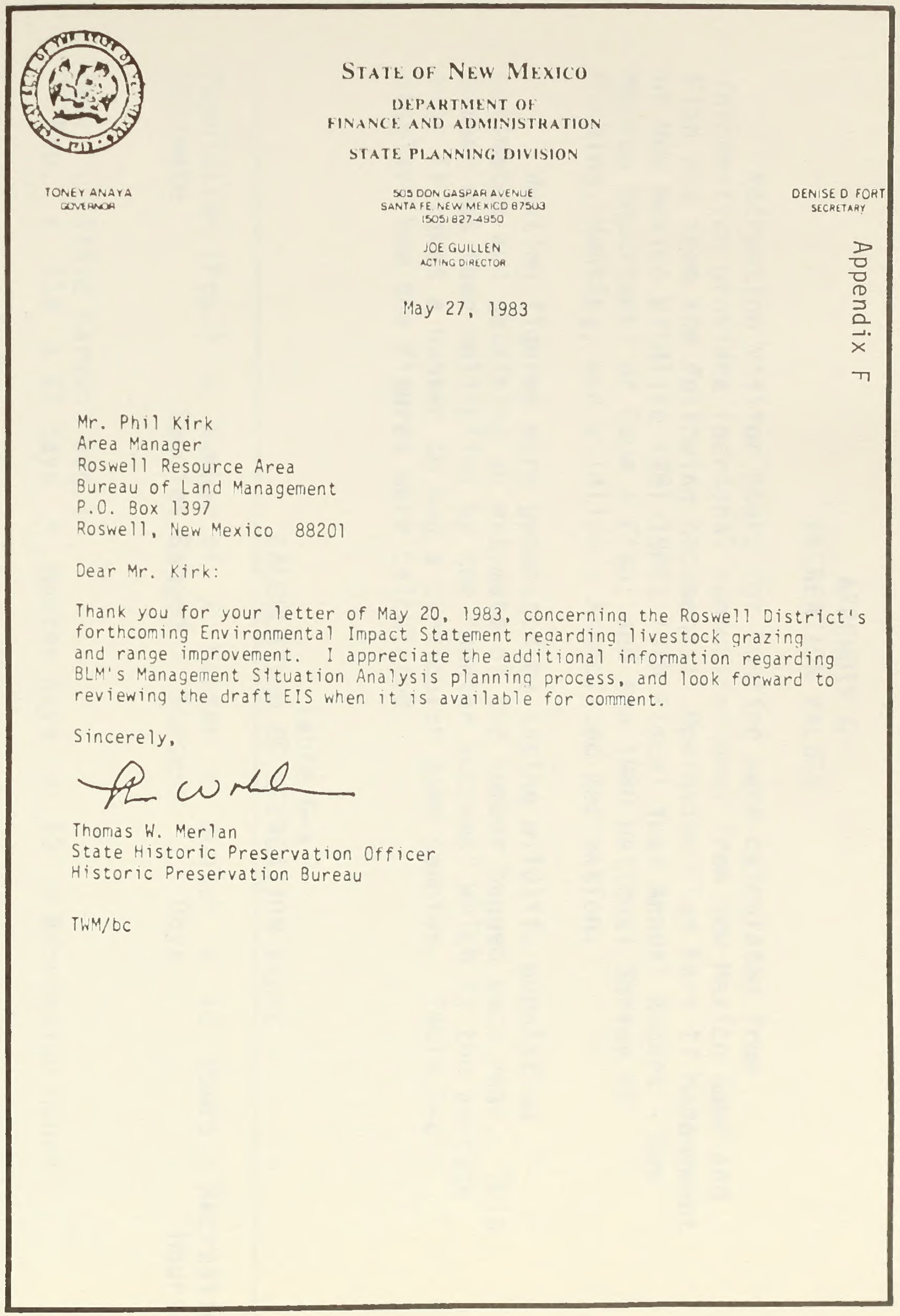
The EIS should include a more specific description of each of the alternatives, so that reviewers can determine for themselves if range improvements do have potential for surface disturbance.

Thank you for your attention to this matter.

Sincerely,

Thomas W. Merlan
State Historic Preservation Officer
Historic Preservation Bureau

TWM/bc



STATE OF NEW MEXICO
DEPARTMENT OF
FINANCE AND ADMINISTRATION
STATE PLANNING DIVISION

TONEY ANAYA
GOVERNOR

505 DON GASPAR AVENUE
SANTA FE, NEW MEXICO 87503
(505) 827-4950

JOE GUILLEN
ACTING DIRECTOR

DENISE D. FORT
SECRETARY

May 27, 1983

Mr. Phil Kirk
Area Manager
Roswell Resource Area
Bureau of Land Management
P.O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Kirk:

Thank you for your letter of May 20, 1983, concerning the Roswell District's forthcoming Environmental Impact Statement regarding livestock grazing and range improvement. I appreciate the additional information regarding BLM's Management Situation Analysis planning process, and look forward to reviewing the draft EIS when it is available for comment.

Sincerely,

Thomas W. Merlan
State Historic Preservation Officer
Historic Preservation Bureau

TWM/bc

APPENDIX G
RECREATION VALUES

Recreation visitor hours for hunting were calculated from information provided (personal cummunications) from New Mexico Game and Fish and from the following documents: Operation Plan Part II Management of New Mexico Wildlife 1981-1985; 70th Fiscal Year Annual Report - New Mexico Department of Game & Fish; and the 1980 National Survey of Fishing, Hunting, and Wildlife - Associated Recreation.

Hunting figures were generated by taking wildlife population estimates and obtaining an estimate of the number bagged each year. This number was then multiplied by the "hunter success" which is the average time it takes a hunter to bag a particular game species. Table G-a displays how the figures were calculated.

Table G-a
CALCULATION OF RECREATION VALUE

Population (Pop.) Estimate x Number of Species Bagged x Hunter Success = Hunter Days x 12 Hours = Recreation Hours

Deer (State harvest avg.)

Pop. x 11% x 22 days = Hunter Days x 12 = Recreation Hours

Antelope (NMF&G and BLM Estimate)

Pop. x 27% westside x 2.1 days = Hunter Days x 12 = Recreation Hours
Pop. x 9% eastside x 2.1 days = Hunter Days x 12 = Recreation Hours

Prairie Chickens (E.S. area harvest avg.)

Pop. x 2.3% x 2.17 days = Hunter Days x 12 = Recreation Hours

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Source: RRA Wildlife files, Sage Ram, NMDG&F

To find expenditures for each activity, different recreation values were multiplied by each activity's recreation hours. The recreation values, or expenditures spent on each activity, were taken from "Sageram," a BLM computer System used for planning purposes. The expenditures were $7.22 spent per hour for deer hunting, $8.53 per hour for antelope hunting, $3.32 per hour for upland game hunting, and $ .89 spent per hour for other recreation activities (camping, rock collecting, etc.)

Visitor hour estimates for dispersed recreation activities were obtained from the 1976 and 1983 Statewide Comprehensive Outdoor Recreation Plans for New Mexico and the Roswell District BLM 1982 Recreation Use reports.

APPENDIX H
THE VISUAL RESOURCE MANAGEMENT (VRM) SYSTEM

The VRM system is implemented in three distinct phases: inventory, environmental assessment, and project planning and design.

Phase I, inventory, is used to identify minimum visual resource management classes for issue resolution in RMP efforts or in those areas where a project is proposed and inventory does not exist. The management classes are based on 1) the inherent quality of the scenery; 2) the visual sensitivity , which expresses the volume of viewers and their attitudes toward changes in the landscape character; and 3) the distance zone, from which the landscape character is being viewed.

Once an area is inventoried for these three factors, it can be put into one of the following 5 clauses which give the manager an objective to meet when determining the impact of landscape modifications on visual resources.

I. Includes the most sensitive visual resources. Class I modifications allow essentially no change in the landscape to be viewed by the public.

II. Changes in any of the basic elements (form, line, color, texture) caused by a management activity should not be evident in the landscape. A contrast may be seen, but should not attract attention.

III. Contrasts to the basic elements caused by a management activity may be evident and begin to attract attention in the landscape. The changes, however, should remain subordinate in the existing landscape.

IV. Contrasts may attract attention and be a dominant feature in the landscape in terms of scale. However, the changes should repeat the basic elements of the landscape.

V. This class is applicable to disturbed areas where BLM has an opportunity to improve the scenic quality by modifying visual intrusion.

The second phase, environmental assessment, is the process of determining the extent of visual impact for a proposed activity that will modify any landscape feature. This is done through the application of a contrast rating (See BLM Manual 8421). Such contrast ratings are applied to potentially high impact projects or those in visually sensitive areas.

The third phase minimizes visual impacts through project planning and design, the objective being to improve visual designs of resource management projects to make them more pleasing to the eye and thereby acceptable to the viewing public.

The policy of the VRM program is to emphasize the project design phase to minimize adverse visual impacts and maximize visual enhancement in highly scenic landscapes and significant high impact projects.

APPENDIX I

ECONOMICS

APPENDIX I
STRUCTURE OF THE ECONOMY

Input/Output Model. An input/output (I/O) approach was used to describe the socio/economic structure of the economy of the Roswell Resource Area. This approach estimates the interrelationships between individual economic sectors (industries) in the economy and permits estimating the impacts on the total economy of an expansion or contraction of a particular economic sector. The predictions of population income and employment change derived from the input/output tables should be considered as estimates.

In 1982, the natural resource industries formed 32.6 percent of the Roswell Resource Area economic base (Table I-1) indicating that these industries are an important part of the economy. The major contributing industries were: BLM range livestock ($5.8 million or 1.6 percent) and other livestock ($90.3 million or 25.5 percent). The livestock industry represents 3.0 percent of the total ecomomy and 9.3 percent of the natural resource base industry. The economic significance, excluding households and final demand as processing sectors is estimated at $1.281 billion, with the BLM range livestock industry accounting for .004 percent.

TABLE I-1

Livestock Inventory for Small Commercial Cow-Calf Ranch in Roswell Resource Area, 1982.

Class	Year Begin	Purchased	Born	Sold	Died	Used	Year End
Cattle							
Cows Beef	54			13	1		54
Heifers 1-2	14				1		16
Steers 1-2				2			
Heifers Calves	17		25	11			14
Steer Calves	2		27	23	2	1	1
Bulls	4	1		1			4
Total Cattle	91	1	52	50	4	1	89
Cattle (91)							
Cattle AUs	77						77
Horses (2)							
Horse AUs	3						3
Total Aus	80						80

Table I-2

Estimated Receipts, Costs, and Returns for Small Commercial Cow-Calf Ranch in the Roswell Resource Area, 1982. (Avg. 79.6 AUs)

	(Sales) No. Per Ranch	Average WT./CWT.	Price per CWT.	Receipts
Cash Receipts:				
Cows	13	7.80	36.00	$ 3,643
Yearling Steers	2	6.00	63.00	752
Heifer Calves	11	3.48	54.00	2,064
Steer Calves	23	3.88	65.00	5,802
Bulls	1			0
Sub-Total	50			$12,261
Non-Cash Receipts: (Livestock Inventory Change)				
Yearling Heifers	2			$ 697
Heifer Calves	- 3			- 786
Steer Calves	- 1			- 290
Sub-Total				$ - 379
Livestock Perquisites				
Steer Calves	1	3.88	65.00	$ 261
Total Receipts				$12,143
Costs:				
Feed; Dietary Supplements				$ 3,226
BLM Grazing Fee				491
State Lease				242
Private Lease				191
Livestock Expenses				177
Fuel and Repairs (Vehicle)				2,585
Hired Labor				193
Improvements (Maintenance, Repairs)				854
Depreciation				4,271
Insurance				682
Taxes				362
Miscellaneous				1,035
Total				$14,309
Returns to Operator Labor, Management, and Capital				$ -2,166

Table I-3

Estimated Short Term Receipts, Costs, and Returns, by Alternative, for Small Commercial Size Cow-Calf Ranch Operations In the Roswell Resource Area.

Item	PA	DPA	ELG	DLG	IPA	MAX
Percent Change a/	0	23.6	-57.6	-23.9	-23.6	-7.9
Gross Income	$12,143	9,278	5,154	9,235	9,278	11,192
Total Cash Cost	10,038	7,898	4,851	7,866	7,898	9,311
Returns Above:						
Cash Costs	2,105	1,380	303	1,876	1,380	1,881
Depreciation	4,271	4,271	4,271	1,369	4,271	4,271
Returns to Operator Labor, Management, and Capital	-2,166	-2,891	-3,968	-2,902	-2,891	-2,390
Herd Size (AUs)	79.6	60.8	33.7	60.5	60.8	73.3

Source: BLM Roswell District Files.
a/ Percent change is in total ranch operation

Table I-4

Estimated Long Term Receipts, Costs, and Returns, by Alternative, for Small Commercial Size Cow-Calf Ranch Operations In the Roswell Resource Area.

Item	PA	DPA	ELG	DLG b/	IPA	MAX
Percent Change a/	0	+25.3	-21.6	NC	+6.7	+75.1
Gross Income	$12,143	15,237	9,524	NC	13,461	21,267
Total Cash Cost	10,038	12,299	8,079	NC	11,116	16,753
Returns Above:						
Cash Costs	2,105	2,938	1,445	NC	2,345	4,514
Depreciation	4,271	4,271	4,271	NC	4,271	4,271
Returns to Operator Labor, Management, and Capital	-2,166	-1,333	-2,826	NC	-1,926	+243
Herd Size (AUs)	79.6	99.8	62.4	NC	85.0	139.4

Source: BLM Roswell District Files.
a/ Percent change is in total ranch operation
b/ No change from short term economic conditions

Table I-5

Livestock Inventory for Medium Commerical Cow-Calf Ranch in the Roswell Resource Area, 1982.

Class	Year Begin	Purchased	Born	Sold	Died	Used	Year End
Cattle:							
Beef Cows	216			43	2		210
Yearling Heifers	39			2	2		41
Yearling Steers	4			17		1	3
Heifer Calves	45		100	48	1		51
Steer Calves	17		103	85	3		15
Bulls	12	2		3			11
Total	333	2	203	198	8	1	331
Cattle (333)							
Cattle AUs	295						289
Horses (4)							
Horse AUs	5						5
Total AUs	300						294

Table I-6

Estimated Receipts, Costs, and Returns for Medium Commericial Cow-Calf Ranch in the Roswell Resource Area, 1982. (Avg. 297.6 AUs)

	(Sales No. Per Ranch	Average WT./CWT.	Price Per CWT.	Receipts
Cash Receipts:				
Cows	43	8.00	36.00	$12,342
Yearling Heifers	2	5.80	52.00	539
Yearling Steers	17	6.20	63.00	6,626
Heifer Calves	48	3.58	54.00	9,263
Steer Calves	85	3.98	65.00	21,942
Bulls	3	14.00	46.00	1,917
Sub-Total	198			$52,629
Non-Cash Receipts: (Livestock Inventory Change)				
Cows	- 7			$ 3,012
Yearling Heifers	2			625
Yearling Steers	- 1			- 348
Heifer Calves	6			1,607
Steer Calves	- 1			- 259
Bulls	- 1			- 982
Sub-Total				-2,369
Livestock Perquisites				
Yearling Steers	1	6.20	63.00	$ 349
Total Receipts				$50,609
Costs:				
Feed: Dietary Supplements				$15,706
BLM Grazing Fee				3,218
State Lease				1,685
Livestock Expenses				3,707
Fuel and Repairs (Vehicle)				4,532
Hired Labor				1,421
Improvements (Maintenance, Repairs)				2,639
Depreciation				10,171
Insurance				1,528
Taxes				924
Miscellaneous				3,573
Total				$49,104
Returns to Operator Labor, Management, and Capital				$ 1,505

Table I-7

Estimated Short Term Receipts, Costs, and Returns, by Alternative, for Medium Commercial Size Cow-Calf Ranch Operations In the Roswell Resource Area.

Item	PA	DPA	ELG	DLG	IPA	MAX
Percent Change a/	0	-2.2	-31.2	-10.0	-2.2	-3.0
Gross Income	50,609	49,482	34,795	45,545	49,482	49,092
Total Cash Cost	38,933	38,131	27,541	35,292	38,131	37,850
Returns Above:						
Cash Costs	11,676	11,351	7,254	10,253	11,351	11,242
Depreciation	10,171	10,171	10,171	10,171	10,171	10,171
Returns to Operator Labor, Management, and Capital	1,505	1,180	-2,917	82	1,180	1,071
Herd Size (AUMs)	297.6	290.9	204.6	267.8	290.9	288.6

Source: BLM Roswell District Files.
a/ Percent change is in total ranch operation

Table I-8

Estimated Long Term Receipts, Costs, and Returns, by Alternative, for Medium Commercial Size Cow-Calf Ranch Operations In the Roswell Resource Area.

Item	PA	DPA	ELG	DLG b/	IPA	MAX
Percent Change a/	0	+3.2	-12.5	NC	+1.3	+23.3
Gross Income	$50,609	52,012	44,246	NC	51,275	62,435
Total Cash Cost	38,933	39,878	34,355	NC	39,423	47,479
Returns Above:						
Cash Costs	11,676	12,134	9,891	NC	11,852	14,956
Depreciation	10,171	10,171	10,171	NC	10,171	10,171
Returns to Operator Labor, Management, and Capital	1,505	1,963	-280	NC	1,681	4,785
Herd Size (AUs)	297.6	307.4	260.1	NC	301.5	367.1

Source: BLM Roswell District Files.
a/ Percent change is in total ranch operation.
b/ No change from short term economic conditions

Table I-9

Livestock Inventory for Large Commercial Cow-Calf Ranch in the Roswell Resource Area, 1982.

Class	Year Begin	Purchased	Born	Sold	Died	Used	Year End
Cattle							
Cows Beef	467			88	7		471
Heifers 1-2	99			22	3		102
Steers 1-2	28			135	1	1	132
Heifers Calves	127		230	93	4	1	132
Steer Calves	141		240	99	10		131
Bulls	28	4		3			29
Total Cattle	890	4	470	440	25	2	895
Cattle (890)							
Cattle AUs	727						736
Horses (11)							
Horse AUs	14						14
Total AUs	741						750

Table I-10

Estimated Receipts, Costs, and Returns for Large Commercial Cow-Calf Ranch in the Roswell Resource Area, 1982. (Avg. 745.3 AUs)

	(Sales) No. Per Ranch	Average WT./CWT.	Price Per CWT.	Receipts
Cash Receipts:				
Cows	88	8.00	36.00	$ 25,328
Yearling Heifers	22	5.80	52.00	6,519
Yearling Steers	135	6.20	63.00	52,692
Heifer Calves	93	3.58	54.00	18,010
Steer Calves	99	3.98	65.00	25,451
Bulls	3	14.00	46.00	1,920
Sub-Total	440			$129,920
Non-Cash Receipts: (Livestock Inventory Change)				
Cows	4			$ 1,968
Yearling Heifers	3			1,043
Yearling Steers	3			1,163
Heifer Calves	6			1,610
Steer Calves	- 10			- 2,810
Bulls	1			1,640
Sub-Total				$ 4,614
Livestock Perquisites				
Yearling Steers	1	6.20	63.00	$ 291
Heifer Calves	1	3.58	54.00	144
Sub-Total				$ 435
Total Receipts				$134,969
Costs:				
Feed; Dietary Supplements				$ 33,287
BLM Grazing Fee				6,856
State Lease				3,892
Livestock Expenses				8,163
Fuel and Repairs (Vehicle)				10,583
Hired Labor				5,166
Improvements (Maintenance, Repairs)				7,876
Depreciation				35,263
Insurance				3,531
Taxes				2,315
Miscellaneous				6,603
Sub-Total				$123,535
Returns to Operator Labor, Management, and Capital				$ 11,434

Table I-11

Estimated Short Term Receipts, Costs, and Returns, by Alternative, for Large Commercial Size Cow-Calf Ranch Operations In the Roswell Resource Area.

Item	PA	DPA	ELG	DLG	IPA	MAX
Percent Change a/	0	-1.6	-25.7	-6.9	-1.6	-5.0
Gross Income	134,969	132,706	100,262	65,553	132,706	128,215
Total Cash Cost	88,272	86,895	67,080	22,516	86,895	84153
Returns Above: Cash Costs	46,697	45,811	33,182	43,037	45,811	44062
Depreciation	35,263	35,263	35,263	35,263	35,263	35263
Returns to Operator Labor, Management, and Capital	11,434	10,548	-2,081	7,774	10,548	8799
Herd Size (AUs)	745.3	732.8	553.6	693.4	732.8	708.0

Source: BLM Roswell District Files.
a/ Percent change is in total ranch operation

Table I-12

Estimated Long Term Receipts, Costs and Returns, by Alternative, for Large Commercial Size Cow-Calf Ranch Operations In the Roswell Resource Area.

Item	PA	DPA	ELG	DLG b/	IPA	MAX
Percent Change a/	0	+5.9	-32.3	NC	+5.1	+14.9
Gross Income	134,969	142,840	91,321	NC	141,888	155,106
Total Cash Cost	88,272	92,997	61,619	NC	92,503	100,576
Returns Above: Cash Costs	46,697	49,843	29,702	NC	49,385	54,530
Depreciation	35,263	35,263	35,263	NC	35,263	35,263
Returns to Operator Labor, Management, and Capital	11,434	14,580	-5,561	NC	14,122	19,267
Herd Size (AUMs)	745.3	790.0	504.2	NC	783.5	802.6

Source: BLM Roswell District Files.
a/ Percent change is in total ranch operation.
b/ No change from short term economic conditions

Table I-13

Livestock Inventory for Medium Commercial Sheep/Cow-calf Ranch in the Roswell Resource Area, 1982.

Class	Year Begin	Purchased	Born	Sold	Died	Used	Year End
Sheep							
Ewes, Aged	42			70	8		55
Ewes, Young	533			21	3		538
Ewes, Yearling	118	5		6	1		124
Lambs	126		576	400	18	1	151
Wethers	4			2		2	6
Bucks	38	7		1	1		38
Total	861	12	576	500	31	3	912
Sheep AUs	172						182
Cattle							
Cows-Beef	97			18	2		93
Heifers, Yearling	16			4	1		15
Steers, Yearling	4			3			3
Heifer Calves	20		45	25	1		19
Steer Calves	2		48	43	2	1	2
Bulls	6	1		1			6
Total	145	1	93	94	6	1	138
Cattle AUs	130						125
Horses	10						10
Horse AUs	12						12
Total AUs	314						319

Table I-14

Estimated Receipts, Costs, and Returns for Medium Commercial Sheep/Cow-Calf Ranch in the Roswell Resource Area, 1982. (Avg. 317 AUs)

	(Sales) No. Per Ranch	Average WT./CWT.	Price per CWT.	Receipts
Cash Receipts:				
Ewes, Aged	70	1.20	12.00	$ 1,008
Ewes, Young	21	1.32	12.00	331
Ewes, Yearlings	6	1.18	12.00	85
Lambs	400	.77	47.00	14,478
Wethers	2	1.20	15.00	34
Bucks	1	1.40	15.00	20
Sub-Total	500			$15,956
Wool	856	.106	105.00	$ 9,526
Wool Incentive Payments:				
Wool	856	.105	80.00	7,190
Lambs	406	.770	2.99	935
Sub-Total				$ 8,125
Cows	18	9.00	36.00	$ 5,854
Yearling Heifers	4	6.20	52.00	1,329
Yearling Steers	3	6.50	63.00	1,168
Heifer Calves	25	4.15	54.00	5,612
Steer Calves	43	4.30	65.00	12,050
Bulls	1	13.00	46.00	569
Sub-Total	94			$26,582
Non-Cash Receipts: (Livestock Inventory Change)				
Ewes, Aged	12			$ 217
Ewes, Young	5			254
Ewes, Yearling	6			301
Lambs	25			1,002
Wethers	2			238
Cows	- 4			- 1,772
Yearling Heifers	- 1			- 333
Yearling Steers	- 1			- 371
Heifer Calves	- 1			- 247
Sub-Total	43			$- 711

(Table I-14 continued)

	(Sales) No. Per Ranch	Average WT./CWT.	Price per CWT.	Receipts
Livestock Perquisites				
Lambs	1	.77	47.00	$ 34
Wethers	2	1.20	15.00	34
Steer Calves	1	4.30	65.00	$ 266
Sub-Total	4			$ 334
Total Receipts				$59,812
Costs:				
Feed; Dietary Supplements				$ 3,970
BLM Grazing Fee				4,609
State Lease				579
Veterinary and Medicine				2,802
Fuel and Repairs (Vehicle)				2,646
Hired Labor				11,540
Improvements (Maintenance, Repairs)				2,885
Depreciation				12,730
Insurance				3,204
Taxes				794
Miscellaneous				3,247
Total				$49,006
Returns to Operator Labor, Management, and Capital				$10,806

Table I-15

Estimated Short Term Receipts, Costs, and Returns, by Alternative,for Medium Commercial Size Sheep/Cow-Calf Ranch Operations In the Roswell Resource Area.

Item	PA	DPA	ELG	DLG	IPA	MAX
Percent Change a/	0	-1.6	-52.5	-15.3	-1.6	-0.3
Gross Income	59,812	58,828	28,403	50,617	58,828	59,638
Total Cash Cost	3,6276	35,749	19,328	31,317	35,749	36,186
Returns Above: Cash Costs	23,536	23,109	9,075	19,300	23,109	23,452
Depreciation	12,730	12,730	12,730	12,730	12,730	12,730
Returns to Operator Labor, Management, and Capital	10,806	10,349	-3,655	6,570	10,379	10,722
Herd Size (AUMs)	317.0	311.7	150.5	268.2	311.7	316.0

Source: BLM Roswell District Files.
a/ Percent change is from ranch operation

Table I-16

Estimated Long Term Receipts, Costs, and Returns, by Alternative,for Medium Commercial Size Sheep/Cow-Calf Ranch Operations In the Roswell Resource Area.

Item	PA	DPA	ELG	DLG b/	IPA	MAX
Percent Change a/	0	+4.1	-10.8	NC	+0.7	+17.9
Gross Income	59,812	62,305	53,312	NC	65,732	70,567
Total Cash Cost	36,276	37 625	32,772	NC	41,981	43,085
Returns Above: Cash Costs	23,536	24 680	20,540	NC	23,751	27,482
Depreciation	12,730	12 730	12,730	NC	12,730	12,730
Returns to Operator Labor, Management, and Capital	10,806	11,950	7,810	NC	11,021	14,752
Herd Size (AUs)	317.0	330.2	282.5	NC	319.5	374.0

Source: BLM Roswell District Files.
a/ Percent change is in total ranch operation.
b/ No change from short term economic conditions

Table I-17

Livestock Inventory For Large Commercial Sheep/Cow-calf Ranch in the Roswell Resource Area, 1982.

Class	Year Begin	Purchased	Born	Sold	Died	Used	Year End
Sheep							
Ewes, Aged	102			165	20		130
Ewes, Young	1,265			50	6		1,275
Ewes, Yearling	279	12		14	3		294
Lambs	299		1367	964	42	3	359
Wethers	10			5		5	14
Bucks	90	7		3	3		91
Total	2,045	19	1367	1201	74	8	2,163
Sheep AUs	409						433
Cattle							
Cows-Beef	339			63	8		324
Heifers	56			14	3		54
Steers	14			11			11
Heifer Calves	71		158	88	3		67
Steer Calves	8		167	150	6	3	8
Bulls	20	3		3			20
Total	508	3	325	329	20	3	484
Cattle AUs	454						433
Horses (12)							12
Horse AUs	15						15
Total AUs	878						881

Table I-18

Estimated Receipts, Costs, and Returns for Large Commerical Sheep/Cow-calf Ranch in the Roswell Resource Area, 1982 (Avg. 879 AUs)

	(Sales) No. Per Ranch	Average WT./CWT.	Price per CWT.	Receipts
Cash Receipts:				
Ewes, Aged	165	1.20	12.00	$ 2,380
Ewes, Young	50	1.32	12.00	794
Ewes, Yearling	14	1.18	12.00	199
Lambs	964	.77	47.00	34,897
Wethers	5	1.20	15.00	95
Bucks	3	1.40	15.00	55
Sub-Total	1,201			$ 38,420
Wool	2,029	.106	105.00	$ 22,590
Wool Incentive Payments:				
Wool	2,029	.105	80.00	$ 17,049
Lambs	963	.770	2.99	2,218
Sub-Total	2,992			$ 19,267
Cows	63	9.00	36.00	$ 20,505
Yearling Heifers	14	6.20	52.00	4,534
Yearling Steers	11	6.50	63.00	4,679
Heifer Calves	88	4.15	54.00	19,501
Steer Calves	150	4.30	65.00	42,011
Bulls	3	13.00	46.00	1,577
Sub-Total	324			$ 92,807
Non-Cash Receipts: (Livestock Inventory Change)				
Ewes, Aged	28			$ 506
Ewes, Young	12			615
Ewes, Yearling	15			747
Lambs	60			2,391
Wethers	4			549
Bucks	1			52
Cows	- 13			- 5,670
Yearling Heifers	- 3			- 923
Yearling Steers	- 3			- 1,028
Heifer Calves	- 3			-686
Sub-Total	98			$- 3,447
Livestock Perquisites				
Lambs	3	.77	47.00	$ 95
Wethers	3	1.20	15.00	47
Steer Calves	3	4.30	65.00	752
Sub-Total	9			$ 894
Total Receipts				$170,531

(Table I-18 continued)

	(Sales) No. Per Ranch	Average WT./CWT.	Price per CWT.	Receipts
Costs:				
Feed; Dietary Supplements				$ 11,115
BLM Grazing Fee				7,539
State Lease				1,887
Livestock Expenses				5,534
Fuel and Repairs (Vehicle)				7,335
Hired Labor				17,447
Improvements (Maintenace, Repairs)				7,999
Depreciation				34,764
Insurance				3,204
Taxes				2,383
Miscellaneous				5,048
Total				$104,255
Returns to Operator Labor, Management, and Capital				$ 66,276

Table I-19

Estimated Short Term Receipts, Costs, and Returns, by Alternative, for Large Commercial Size Sheep/Cow-Calf Ranch Operations In the Roswell Resource Area.

Item	PA	DPA	ELG	DLG	IPA	MAX
Percent Change a/	0	-0.4	-36.7	-8.4	-0.4	-0.7
Gross Income	170,728	169,884	108,064	156,328	169,884	169,525
Total Cash Cost	69,491	69,184	46,041	64,109	69,184	69,050
Returns Above: Cash Costs	101,040	100,700	62,023	92,216	100,700	100,475
Depreciation	34,764	34,764	34,764	34,764	34,764	34,764
Returns to Operator Labor, Management, and Capital	66,276	65,936	27,259	57,455	65,936	65,711
Herd Size (AUs)	879.0	874.7	556.4	804.9	874.7	872.8

Source: BLM Roswell District Files.

a/ Percent change is in total ranch operation

Table I-20

Estimated Long Term Receipts, Costs, and Returns, by Alternative, for Large Commercial Size Sheep/Cow-Calf Ranch Operations In the Roswell Resource Area.

Item	PA	DPA	ELG	DLG b/	IPA	MAX
Percent Change a/	0	+2.0	-1.9	NC	+0.7	+12.9
Gross Income	170,531	174,288	167,338	NC	171,936	192,912
Total Cash Cost	69,491	71,133	68,231	NC	69,952	77,805
Returns Above: Cash Costs	101,237	103,155	99,107	NC	101,984	115,107
Depreciation	34,764	34,764	34,764	NC	34,764	34,764
Returns to Operator Labor, Management, and Capital	66,276	68,391	64,343	NC	67,220	80,343
Herd Size (AUMs)	879.0	897.3	861.5	NC	885.2	993.2

Source: BLM Roswell District Files.

a/ Percent change is in total ranch operation.

b/ No change from short term economic conditions

GLOSSARY

GLOSSARY

ADJUSTMENTS IN NUMBERS. Change (increase or decrease) of livestock numbers to conform to the amount of forage produced in an area considering other multiple uses.

ALLOTMENT. An area of land designated and managed for grazing of livestock where grazing privileges are permitted or leased to livestock operators.

ALLOTMENT MANAGEMENT PLAN (AMP). A documented program which applies to livestock operations on public land, prepared in consultation with the permittee(s) or lessee(s) involved, and which : (1) prescribes the manner in and extent to which livestock operations will be conducted in order to meet the multiple-use, sustained-yield, economic, and other needs and objectives as determined for the public land through land use planning; and (2) describes the type, location, ownership, and general specifications for the rangeland improvements to be installed and maintained on the public land to meet the livestock grazing and other objectives of land management; and (3) contains such other provisions relating to livestock grazing and other objectives as may be prescribed by the authorized officer consistent with applicable law.

ANIMAL UNIT (AU). Considered to be one mature (1,000 lbs.) cow or its equivalent based upon average daily forage consumption of 26 pounds of dry matter per day.

ANIMAL UNIT MONTH (AUM). The amount of food or forage required by an animal-unit for one month.

ANNUAL PLANT SPECIES. A plant that completes its life cycle and dies in 1 year or less.

AVAILABLE FORAGE. That forage which is available for allocation to livestock and wildlife after the proper use factors for key forage species on specific range sites has been reached.

BIOACCUMULATION. The uptake of substances from the environment, other than food. Generally, the uptake of environmental pollutants.

BROWSE. (noun) That part of leaf and twig growth of shrubs, woody vines, and trees available for animal consumption. (verb) To consume browse.

CLIMAX VEGETATION COMMUNITY. The vegetation community which emerges after a series of successive vegetational stages and perpetuates itself indefinitely unless disturbed by outside forces.

CONDITION. A quantitiative comparison of a plant community with a hypothetical plant community which could arise in the same place under natural conditions.

COOPERATIVE AGREEMENT. Agreement whereby the permittee agrees to provide funds for construction and maintenance of a rangeland development.

COOPERATIVE MANAGEMENT PLAN (CMP). Written plans designed to enhance range condition by improving distribution of livestock and providing the proper use and periodic rest of available forage on public land in cooperation with the permittee or lessee. These plans specify goals and objectives for grazing management and the steps required to attain the desired results on individual allotments.

COVER. Small rocks, litter, basal areas of grass and forbs and aerial coverage of shrubs that provide protection to the soil surface; i.e., in contract to bare ground.

CULTURAL RESOURCE INVENTORY CLASSES. Class I - Existing data inventory: an inventory study of a defined area designed to provide a narrative overview (cultural resource overview) derived from existing cultural resource information and to provide a compilation of existing cultural resource site record data on which to base the development of the BLM's site record system.

Class II - Sampling field inventory: a sample-oriented field inventory designed to locate and record from surface and exposed profile indications all cultural resource sites within a portion of a defined area in a manner which will allow an objective estimate of the nature and distribution of cultural resources in the entire defined area. The Class II inventory is a tool utilized in management and planning activities as an accurate predictor of cultural resources in the area of consideration. The primary area of consideration for the implementation of a Class II inventory is a planning unit. The secondary area is a specific project in which an intensive field inventory (Class III) is not practical or necessary.

Class III - Intensive field inventory: an intensive field inventory designed to locate and record from surface and exposed profile indications all cultural resource sites within a specified area. Normally, upon completion of such inventories in an area, no further cultural inventory work is needed. A Class III inventory is appropriate on small project areas, all areas to be disturbed, and primary cultural resource areas.

DEFERRED ROTATION GRAZING. Discontinuance of grazing on various parts of a range in succeeding years, allowing each part to rest successively during the growing season to permit seed production, establishment of seedlings, or restoration of plant vigor. At least two, but usually three or mroe separate units are required.

DEFOLIATE. To cause the leaves of a plant to fall off, especially prematurely.

DENSITY. (Plant) The number of individuals per unit of area; refers to the relative closeness of individual plants to one another.

DESIRABLE FORAGE PLANT. Plants which are palatable and productive forage species, generally dominant under climax or near climax conditions, long-lived, and have deep fibrous roots to protect the watershed against erosion.

DIRECT ECONOMIC IMPACT. Employment or income changes for individual economic sectors (industries) resulting from permitted grazing adjustments.

DISCLIMAX. A relatively stable ecological community which often includes species that have displaced the climax due to disturbance, especially by man or domestic animals.

ECOLOGICAL CONDITION. The present composition of the vegetation on a range site in relation to the climax (natural potential) plant community for that site. Four ecological condition classes are used to indicate the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the climax plant community for the site.

Ecological Condition Class	Percentage of present plant community that is climax for the range site
Excellent	76 - 100
Good	51 - 75
Fair	26 - 50
Poor	0 - 25

ECOSYSTEM. An interacting natural system including all the component organisms together with the abiotic (non-living) environment.

ENDANGERED SPECIES. Federally listed - Any species or plant in danger of extinction throughout all or a significant portion of its range.

State (Group I) - Species whose prospect of survival or recruitment in the state are in jeopardy in the foreseeable future.

State (Group II) - Species whose prospect of survival or recruitment within the state may become jeopardized in the foreseeable future.

ENVIRONMENTAL ASSESSMENT (EA). (a) A concise public domument for which a Federal agency is responsible that serves to: (1) briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact; (2) Aid an agency'c compliance with the National Environmental Protection Agency (NEPA) when no environmental impact statement is necessary; (3) Facilitate preparation of a statement when one is necessary. (b) Includes brief discussions of the need for the proposal, of alternatives as required by Sec. 102 (2) (D) of NEPA, of the environmental impacts of the proposed action and other alternatives, and a listing of agencies and persons consulted.

ENVIRONMENTAL IMPACT STATEMENT (EIS). A detailed written statement (document) required by Section 102 (2)(C) of NEPA. This analytical document is developed for use by decisionmakers to weigh the environmental consequences of a potential decision. An EIS should accurately portray potential impacts on the human environment of a particular course of action and its possible alternatives.

ERODIBILTIY. Being susceptible to erosion. (Expressed by such terms as highly erodible, slightly erodible, etc.)

EROSION. The wearing away of the land surface by running water, wind, ice, or other geological agents including such processes as gravitational creep.

FORAGE ALLOCATION. The amount of or percentage of the total forage produced, which is designated for a particular use such as livestock grazing, wildlife, or watershed protection.

FORAGE (COMPETITIVE). Plants which are used as food by large herbivores, such as cattle, and by large and small wildlife.

FORB. Any herbaceous non-woody plant that is not a grass or grass-like plant.

GRAZING DISTRICT (BOUNDARY). Is the specific area within which the public lands are administered under Section 3 of the Taylor Grazing Act. Public lands outside grazing district boundaries are administered under Section 15 of the Taylor Grazing Act.

GRAZING LEASE. A document authorizing use of the public lands outside grazing districts for the purpose of grazing livestock under Section 15 of the Taylor Grazing Act.

GRAZING PERMIT. A document authorizing use of public land within a grazing district for the purpose of grazing livestock under Section 3 of the Taylor Grazing Act.

GRAZING PREFERENCE. The total number of animal unit months of livestock grazing on public land apportioned and attached to base property owned or controled by a permittee or lessee.

GRAZING MANAGEMENT TREATMENT. Under a grazing system, grazing or resting a particular unit of land (usually a pasture) at particular times each year to attain specific vegetative goals.

HABITAT. An area where a plant or animal lives. (Sum total of environmental conditions in the area.)

HABITAT MANAGEMENT PLAN (HMP). A written and officially approved plan for a specific geographical area of public land which identifies wildlife habitat and related objectives, establishes the sequence of actions for achieving objectives, and outlines procedures for evaluating accomplishments.

HALF-LIFE. The time required for half the amount of a substance introduced into a system to be eliminated by excretion, decomposition, or other natural process.

HERBACEOUS. A plant having little or no woody tissue

INFILTRATION. The movement of water through the soil surface into the soil.

INFRASTRUCTURE. The basic framework or underlying foundation of an economy which facilitates the flow of goods and services between buyers and sellers. It includes local organizations, institutions, services, systems and facilities.

INPUT/OUTPUT MODEL. An economic model used to predict or stimulate the economy for the purpose of this study.

INTERIOR FENCE. Fences used to divide allotments into pastures or holding areas.

INVERSION. A reversal of normal atmospheric temperature gradient; an increase in air temperature with increasing altitude.

KIND OF LIVESTOCK. Kinds of domestic livestock grazing on rangeland: cattle, horses, sheep, or goats, or a combination of these. May be broken down to greater detail such as cows with calves, yearlings, steers, ewes, ewes with lambs, etc.

LEACHING. To extract from some material.

LEAST DESIRABLE FORAGE PLANTS. Plants which are definitely the poorer species in a type of community and consist principally of invaders, noxious, or low-value forage plants.

LITHIC SCATTER. A Prehistoric cultural site type where flakes, cores, and stone tools are located either through the manufacture or use of the tools.

LONG-TERM IMPACT. The future in time when rangeland condition would have improved sufficiently to satisy objectives. For analysis purposes in this EIS, the long term will consist of the time period through 2010.

MALPAIS. A Spanish word meaning rough country underlain by dark basaltic lava.

MANAGEMENT FRAMEWORK PLAN (MFP). A planning decision document that establishes, for a given planning area, land use allocations, coordination guidelines for multiple use, and management objectives to be achieved for each class of land use or protection. BLM's land use plan. An MFP is prepared in three steps: (1) resource recommendations, (2) impact analysis and alternative development, and (3) decision making.

MICROCLIMATE. The local climate of a given site or habitat of variable size.

MITIGATING MEASURES. Measures taken to alleviate, moderate, or diminish the effects of an action.

NICHE. The role of an animal in its ecological community.

NON-CASH RECEIPTS. Number changes in a herd from January 1 to December 31 by age, sex and type of livestock, multiplied by the ending inventory values per head. (Definition from Organization Costs and Returns of Cattle Ranches in Southwestern New Mexico, 1979. New Mexico State University, AGricultural Experiment Station, Bulletin 684.)

PALEONTOLOGY. The science that deals with the life of past geological periods, based on the study of fossil remains of plants and animals.

PHOTODECOMPOSITION. Chemical decomposition by means of radiant (light) energy.

PHOTODEGRADATION. Chemical degradation by means of radiant (light) energy.

PIONEER PLANT. A plant capable of establishing itself in a bare or barren area, initiating a new ecological cycle.

POSTEMERGENCE. The seedling stage of a plant.

PREEMERGENCE. Occurring before emergence of seedlings aboveground.

PREFERENCE. See Grazing Preference.

PRIMARY SUCCESSION. The natural replacement on previously unvegetated areas of plants by other plants better adapted to improving soil and moisture conditions until a plant community arises and can continuously perpetuate itself.

PSEUDORIPARIAN AREAS. Intermittent drainages (arroyos) supporting a more varied vegetative composition than the surrounding upland areas.

RADIOCARBON DATING. A technique for dating archaeological and geological materials which uses a heavy radio-active isotope of carbon (C^{14}) as a tracer.

RANGELAND. Land on which the vegetation is predominantly grasses, grass-like plants, forbs, or shrubs usually suitable for grazing or browsing use.

RANGELAND CONDITION TREND. The direction of change in rangeland condition.

RANGELAND IMPROVEMENT. Any activity or program on or relating to rangelands which are designed to improve production of forage, change vegetative composition, control patterns of use, provide water, stabilize soil and water conditions, and provide habitat for livestock or wildlife.

RANGELAND MANAGEMENT. A distinct discipline founded on ecological principles and dealing with the husbandry of rangelands and range resources.

RANGELAND MANAGEMENT PROGRAM. Management of the rangeland resource as determined through development of BLM multiple land-use planning documents. During development of multiple land-use planning documents, BLM uses and observes the principles of: 1) multiple use, 2) sustained yield, 3) public participation, 4) intergovernmental cooperation, 5) a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, sociological, economic and other sciences, 6) present and potential uses of public lands, 7) relative scarcity of values involved, 8) long-term benefits to the public versus short-term benefits, and 9) compliance with applicable Federal and State pollution control laws.

RANGELAND PROGRAM SUMMARY (RPS). A document to be issued subsequent to the finalization of this EIS. The RPS will reveal the BLM Roswell District Manager's final land use decision for the Range Management Program. Included in the document will be the consultation and decision schedule for each allotment.

RANGE SITE. Rangeland that differs in its ability to produce a characteristic natural plant community. A range site is the product of all the environmental factors responsible for its development. It is capable of supporting a native plant community typified by an association of species that differ from other range sites in the kind or proportion of species or total production. (SCS 1976)

RAPTOR. Any predatory bird (such as a falcon, hawk, eagle, or owl) that has feet with sharp talons or claws adapted for seizing prey and a hooked beak for tearing flesh.

REST ROTATION GRAZING SYSTEM. A grazing system providing for systematic and sequential grazing by livestock and resting from livestock use on a rangeland area to provide for the production of livestock while simultaneously maintaining or improving the vegetation and soil fertility.

RIPARIAN VEGETATION. Vegetation which occurs in or adjacent to drainage ways or their flood plains.

SEASON OF USE. The times of the year when domestic animals would be allowed to graze on a specific unit of rangeland, as designated by license.

SECONDARY SUCCESSION. A process similar to primary succession except that a climax community previously on the site has been destroyed by some disturbance. See "Primary Succession."

SECTION 3 PERMIT. A permit authorizing grazing use on public lands inside the District boundary. It is a reference to that section of the Taylor Grazing Act pertaining to land within the District boundary.

SECTION 4 PERMIT. A permit issued by BLM for the permittee to construct a project on public lands.

SECTION 15 PERMIT. A permit issued by BLM for the lessee to construct a project on public lands.

SECTOR. The division of the economy in areas such as the BLM Range livestock industry, other livestock industries, etc.

SEDIMENT. Solid, clastic material, both mineral and organic, that is in suspension, is being transported or has been moved from its site of origin by water, wind, or ice and has come to rest on earth's surface, either above or below sea leve.

SERAL STAGE. A stage in the course of climax (ecological) development.

SHORT-TERM IMPACT. The time period during which adjustments in permitted grazing levels on public land would be made. For analysis purposes in this EIS, the short term will consist of 0-5 years from implementation.

SILT. Sedimentary material consisting primarily of mineral particles intermediate in size between sand and clay.

SOCIAL CHANGE. The alternation in patterns of social structure, social institutions and social behavior over time.

SUBCLIMAX. A stage or community in ecological succession immediately preceeding the climax.

SUCCESSIONAL STAGE. A vegetative community which is part of a progressive series leading to a community which perpetuates itself indefinitely under the environmental conditions.

SUSPENSION. Suspension means temporarily withholding, in whole or in part,a grazing perference from active grazing use. The withholding may be done voluntarily by the permittee or lessee.

SWALE. A range site occurring in a slightly depressed position which is level to moderately sloping and receives runoff from adjacent sites.

TARGET SPECIES. In plant control, the species for which the project is designed to reduce or control.

THREATENED SPECIES. Any species likely to become endangered within the foreseeable future throughout all or a significant part of its range.

TOXICITY. The state or relative degree of being toxic or poisonous.

UTILIZATION. The proportion of a year's forage production that is consumed or destroyed by grazing animals, usually expressed as a percentage. Percentage breakdowns are slight 0-20%, light 21-40%, moderate 41-60%, heavy 61-80%, and severe 81-100%.

VEGETATIVE COMPOSITION. The proportion of the total vegetation cover or weight provided by each species, expressed in percent.

VEGETATION TREATMENTS. Methods used to control the growth and spread of undesirable vegetation. Control can be by chemical or mechanical means or by fire.

VIGOR. (plant) The relative well being and health of a plant as reflected by its ability to manufacture sufficient food for growth and maintenance.

VOLATILIZATION. The process of being vaporized at relatively low temperatures.

WILDERNESS STUDY AREA (WSA). A roadless area or island that has been inventoried and found to have wilderness characteristics as described in Section 603 of FLPMA and Section 2(c) of the Wilderness Act of 1964 (78 Stat. 891).

List of Scientific Names

Common Name	Scientific Name
I. Grasses	
Alkali Sacaton	*Sporobolus airoides*
Black Grama	*Bouteloua eriopoda*
Blue Grama	*Bouteloua gracilis*
Bluestem	*Andropogon, Schizachrium spp.*
Fescue	*Festuca spp.*
Galleta	*Hilaria jamesii*
Giant Sacaton	*Sporobolus wrightii*
Gyp Dropseed	*Sporobolus neallyi*
Gyp Grama	*Bouteloua breviseta*
Hairy Grama	*Bouteloua hirsuta*
Mesa Dropseed	*Sporobolus flexuosus*
Metcalf Muhly	*Muhlenbergia metcalfii*
Mountain Muhly	*Muhlenbergia montana*
Sand Bluestem	*Andropogon hallii*
Sand Dropseed	*Sporobolus cryptandrus*
Sideoats Grama	*Bouteloua curtipendula*
Spike Dropseed	*Sporobolus contractus*
Tobosa	*Hilaria mutica*
Tridens	*Tridens spp.*
II. Forbs	
Coldenia	*Coldenia spp.*
Croton	*Croton spp.*
Desert Holly	*Perezia nana*
Guadalupe Milkvetch	*Astragalus pictiformis*
Winterfat	*Ciratoides lanata*
Zephyr Lily	*Zephyranthes longifolia*
III. Shrubs, Half-Shrubs, Cacti	
Acacia	*Acacia spp.*
Annual Broomweed	*Xanthocephalum dracunculoides*
Catclaw Mimosa	*Mimosa biuncitera*
Cholla	*Cholla spp.*
Creosote	*Larrea tridentata*
Davis Cholla	*Opuntia davisii*
Four-Wing Saltbush	*Atriplex canescens*
Mariola	*Parthenium incanum*
Mesquite	*Prosopis glandulosa*
Prickly Pear	*Opuntia spp.*
Sacahuista	*Nolina microcarpa*
Sandsage	*Artemisia filifolia*
Shinnery Oak	*Quercus havardii*
Snakeweed	*Xanthocephalum sarothrae*
Sumac (Little-Leaf)	*Rhus trilobata*
Yucca	*Yucca spp.*

List of Scientific Names (continued)

Common Name	Scientific Name
IV. Trees	
Juniper	*Juniperus spp.*
Mountain Mahogany	*Cercocarpus montnaus*
Pinyon	*Pinus edulis*
Salt Cedar	*Tamarix spp.*
V. Animals	
Desert Mule Deer	*Odocoileus hemionus crooki*
Pronghorn Antelope	*Antilocapra americana*
Baird's Sparrow	*Ammodramus bairdii*
Lesser Prairie Chicken	*Tympanuchus pallidicinctus pallidicinctus*
McCown's Longspur	*Calcarius mccowni*
Scaled Quail	*Callipepla squamata arizonica*
Eastern Fence Lizard	*Sceloporus undulatus*
Lesser Earless Lizard	*Holbrookia maculata*
Marbled Whiptail Lizard	*Cnemidophorus tigris*
Side-Blotched Lizard	*Uta stansburiana*
Trams-Pecos Rat Snake	*Elaphe subocularis*

Acronyms and Abbreviations

AMP	Allotment Management Plan
AMS	Analysis of Management Situation
AU	Animal Unit
AUM	Animal Unit Month
BLM	Bureau of Land Management
"C"	Custodial (Category)
CMP	Cooperative Management Plan
DLG	Decreased Livestock Grazing
DPA	District Preferred Alternative
EA	Environmental Assessment
ELG	Elimination of Livestock Grazing
EPA	Environmental Protection Agency
FLPMA	Federal Land Policy and Management Act
HMP	Habitat Management Plan
"I"	Improve (Category)
IPA	Industry Preferred Alternative
"M"	Maintain (Category)
MAX	Maximization of Livestock Forage (Alt. 3)
MFPA/EIS	Management Framework Plan Amendment/Environmental Impact Statement
NEPA	National Environmental Policy Act
NMDA	New Mexico Department of Agriculture
NMDG&F	New Mexico Department of Game and Fish
NMHP	New Mexico Heritage Program
PA	Proposed Action
PRIA	Public Rangelands Improvement Act
RMP	Resource Management Plan
ROD	Record of Decision
RPS	Rangeland Program Summary
RRA	Roswell Resource Area
SCS	Soil Conservation Service
SHF	Special Habitat Feature
SHPO	State Historic Preservation Officer
SOPs	Standard Operating Procedures
T/E	Threatened and Endangered
USFWS	United States Fish and Wildlife Service

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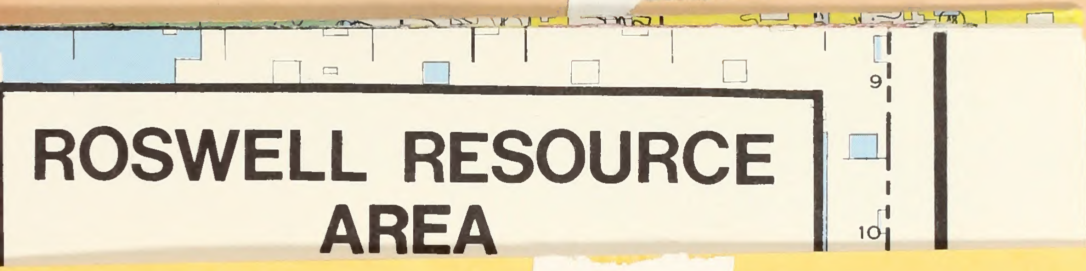
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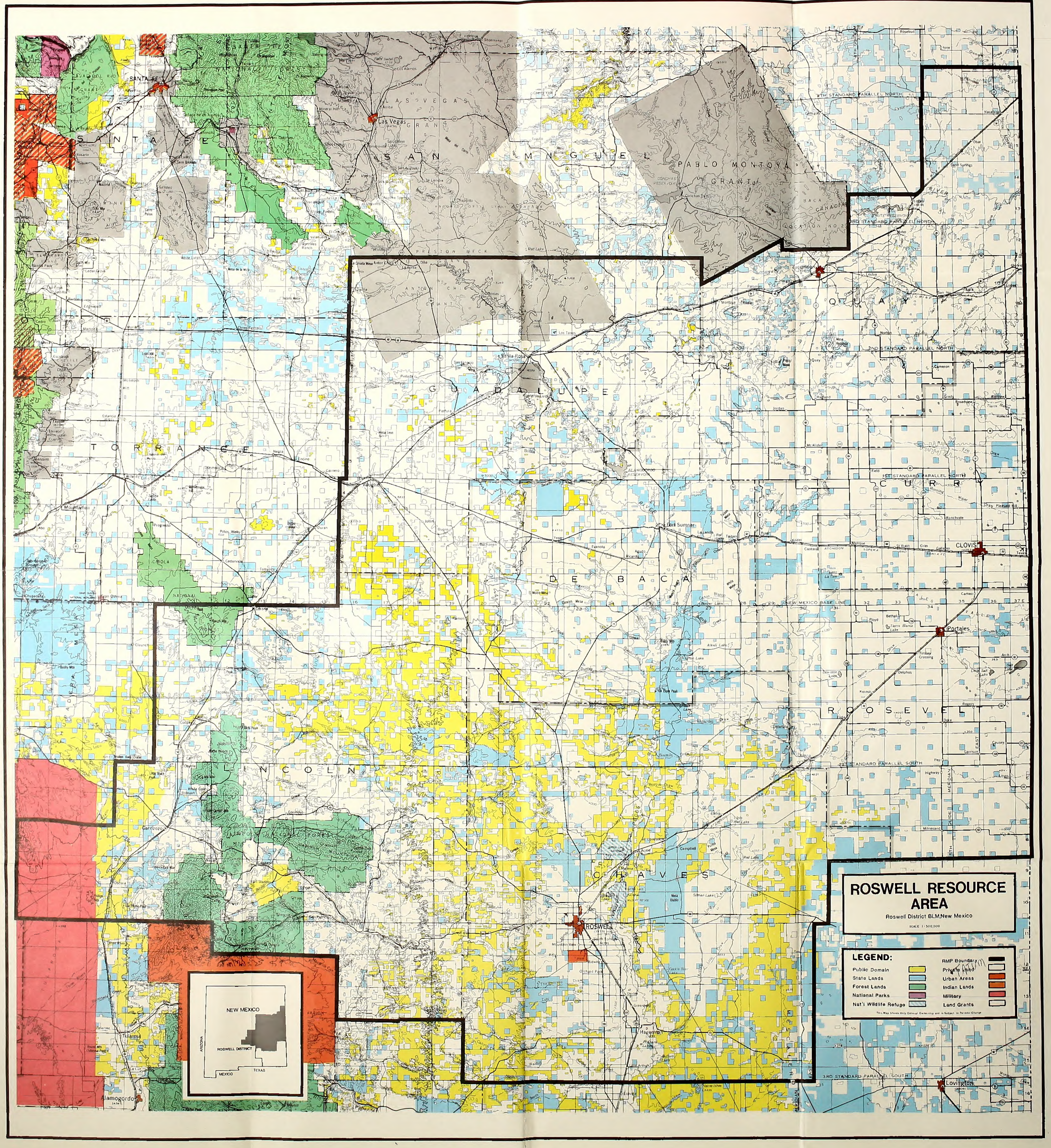
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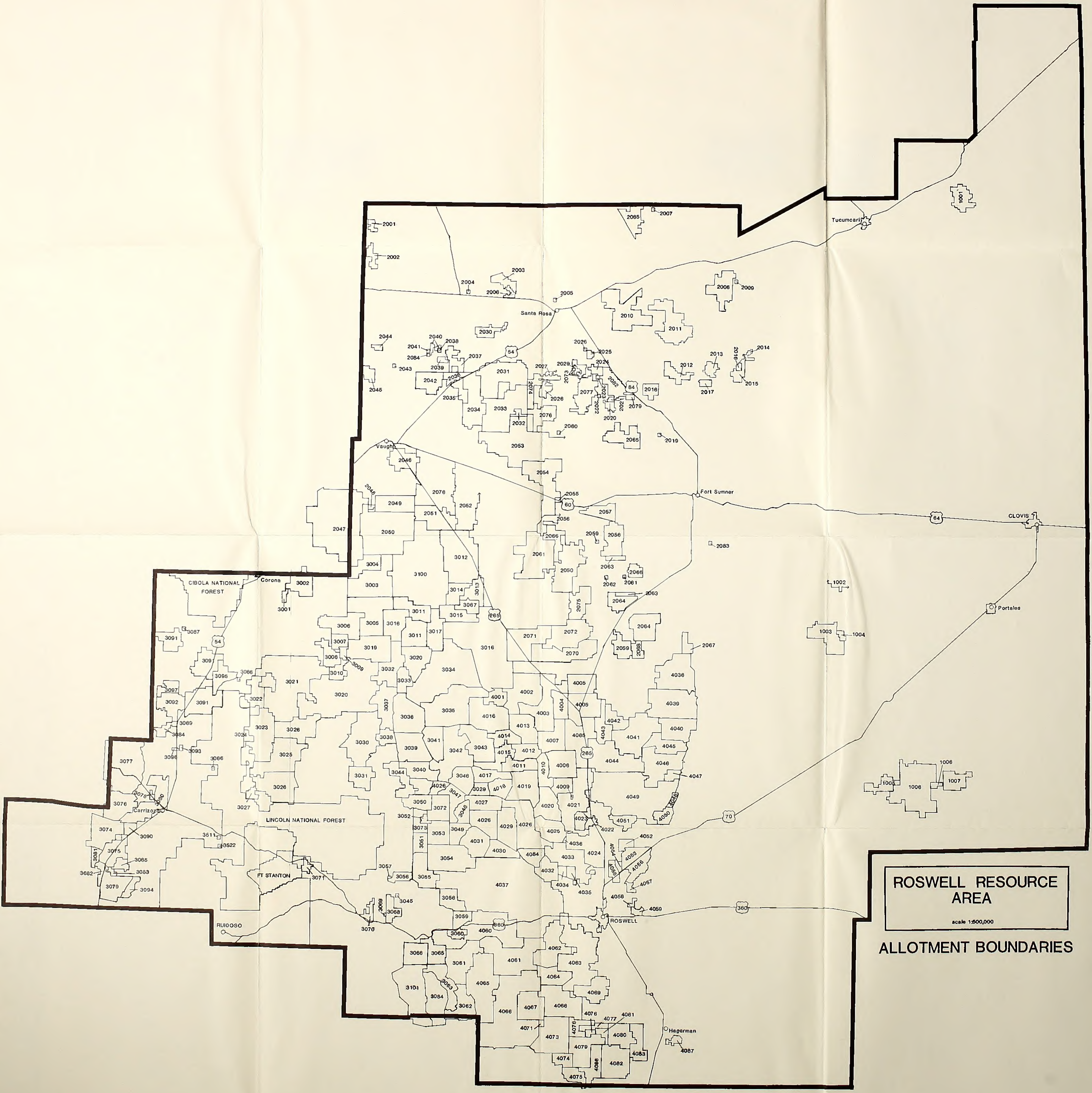

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